

DIPLOMADO DE PROFUNDIZACIÓN CISCO

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GRUPO 203092_4

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA
ECBTI
INGENIERIA DE TELECOMUNICACIONES
BUCARAMANGA
2019
PRUEBA DE HABILIDADES CCNA

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DIPLOMADO CISCO PRUEBA DE HABILIDADES CCNA

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Nota de Aceptación

Presidente del Jurado

Jurado

Jurado

Bucaramanga (10, 07, 2019) (Fecha de entrega)

El siguiente trabajo va dedicado a mi madre la cual es el apoyo fundamental en mi día a día tanto profesionalmente como personal.

CONTENIDO

	Pág.
1. INTRODUCCIÓN	6
2. OBJETIVOS.....	7
3 PLANTEAMIENTO DEL PROBLEMA	8
3.1 DEFINICIÓN DEL PROBLEMA	8
5.1 MATERIALES	9
6 DESARROLLO DEL PROYECTO	10
CONCLUSIONES	48
BIBLIOGRAFÍA.....	77

1. INTRODUCCIÓN

En el siguiente trabajo se dará la resolución de habilidades de CISCO el cual se dará con dos problemas en diferentes metodologías, esto hará parte de los tópicos visto en la plataforma NETCAD CCNA 1 y 2 el cual cubrirá todo lo propuesto en estos dos escenarios.

2. OBJETIVOS

2.1 OBJETIVO GENERAL

- Resolución de problemas de redes en plataforma cisco

2.2 OBJETIVOS ESPECÍFICOS

- Reconocer la estructura de los modelos de capas OSI y TCP/IP, su importancia, el rol que desempeña cada nivel y su eficiencia a la hora de integrarse tecnológicamente en redes de computadores.
- Estudiar los aspectos básicos y elementos de las redes de telecomunicación y de las técnicas de conmutación, así como los principales protocolos y servicios de seguridad en redes.
- Analizar los conceptos relacionados con la arquitectura, funciones, componentes y modelos de Internet y otras redes de computadores. Diseñar y documentar un esquema de direccionamiento según los requisitos.
- Aplicar una configuración básica a los dispositivos de red. Configurar una prioridad de routers, RID y el enrutamiento OSPF.
- Verificar la completa conectividad entre todos los dispositivos de la topología. Adiestrarse en el uso de herramientas de simulación y laboratorios de acceso remoto de última tecnología orientados hacia el diseño y configuración de redes de datos

3 PLANTEAMIENTO DEL PROBLEMA

3.1 DEFINICIÓN DEL PROBLEMA

Problema 1

Una empresa posee sucursales distribuidas en las ciudades de Bogotá y Medellín, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red

Problema 2

Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Miami, Bogotá y Buenos Aires, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red

5. MATERIALES Y MÉTODOS

5.1 MATERIALES

En el siguiente trabajo se utilizó el software de PKT el cual es un simulador de redes de Cisco el cual me permitirá dar solución a la temática.

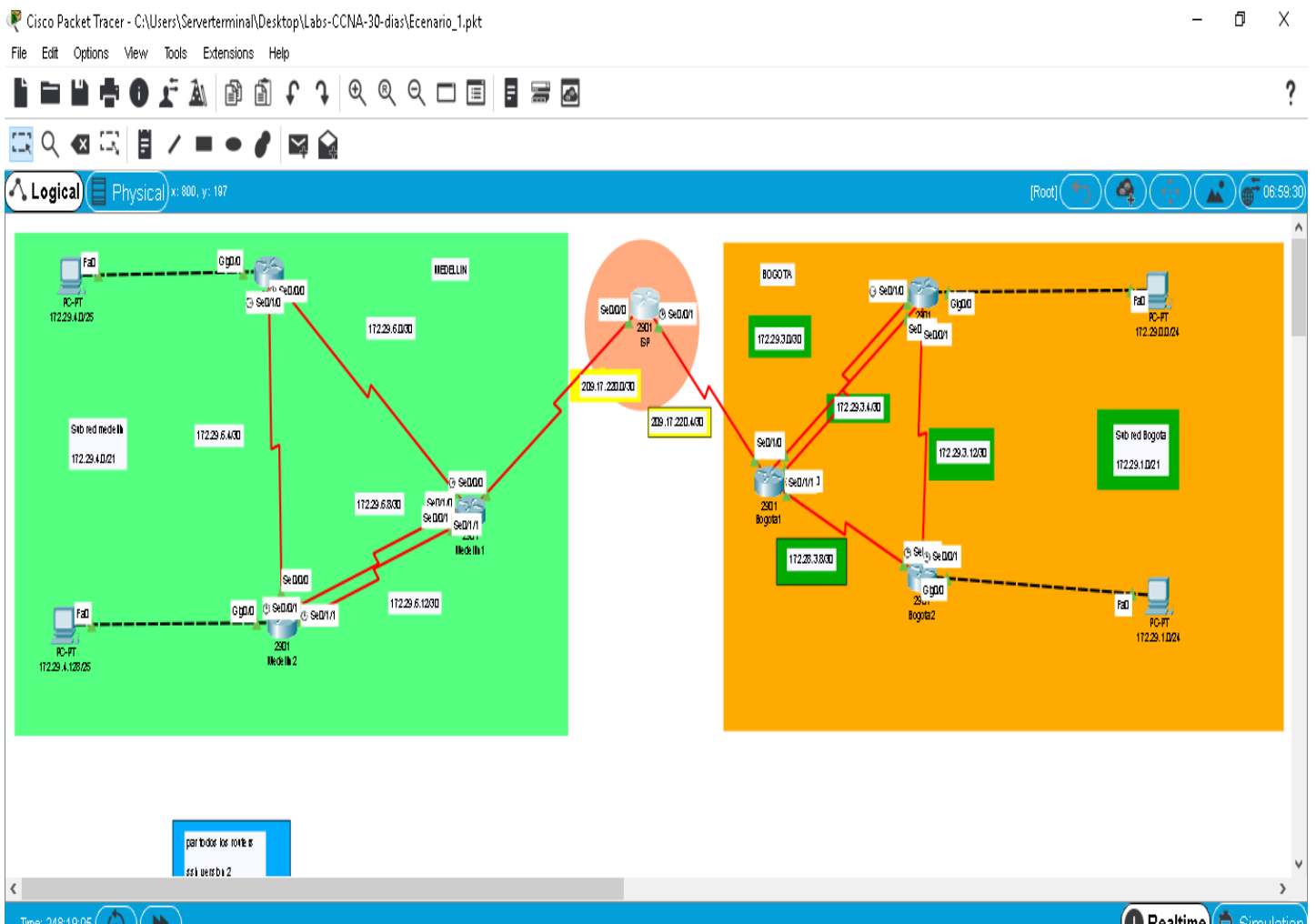
5.2 METODOLOGÍA

Configuración en CLI de IOS Cisco el cual nos permite la manipulación de comandos sobre Shell de los dispositivos,

6 DESARROLLO DEL PROYECTO

Se desarrollará el procedimiento de configuración del escenario 1 de la prueba de habilidades de CCNA

Figura-Ecenario-1

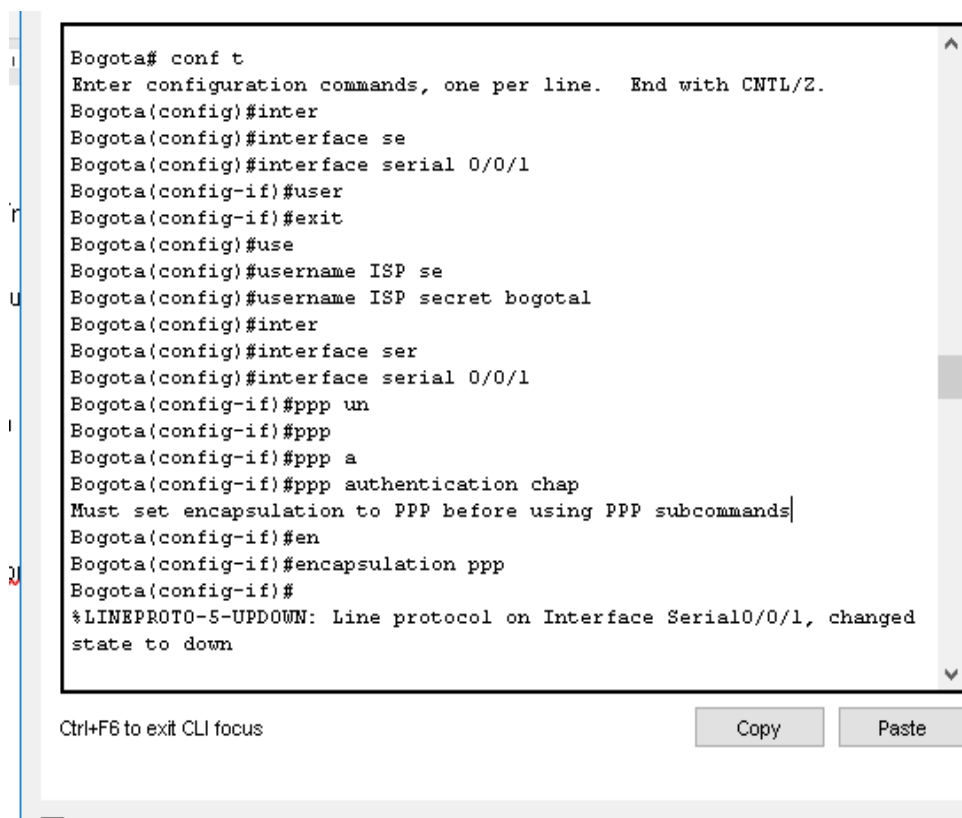


a. Según la topología se requiere que el enlace Medellín1 con ISP sea configurado con autenticación PAT.

b. El enlace Bogotá1 con ISP se debe configurar con autenticación CHAT.

Configuración enlace S0/0/1 con PPP y autenticación CHAP bogota1

```
Bogota(config)#username ISP secret bogota1
Bogota(config)#interface serial 0/0/1
Bogota(config-if)#ppp authentication chap
Must set encapsulation to PPP before using PPP subcommands
Bogota(config-if)#encapsulation ppp
```



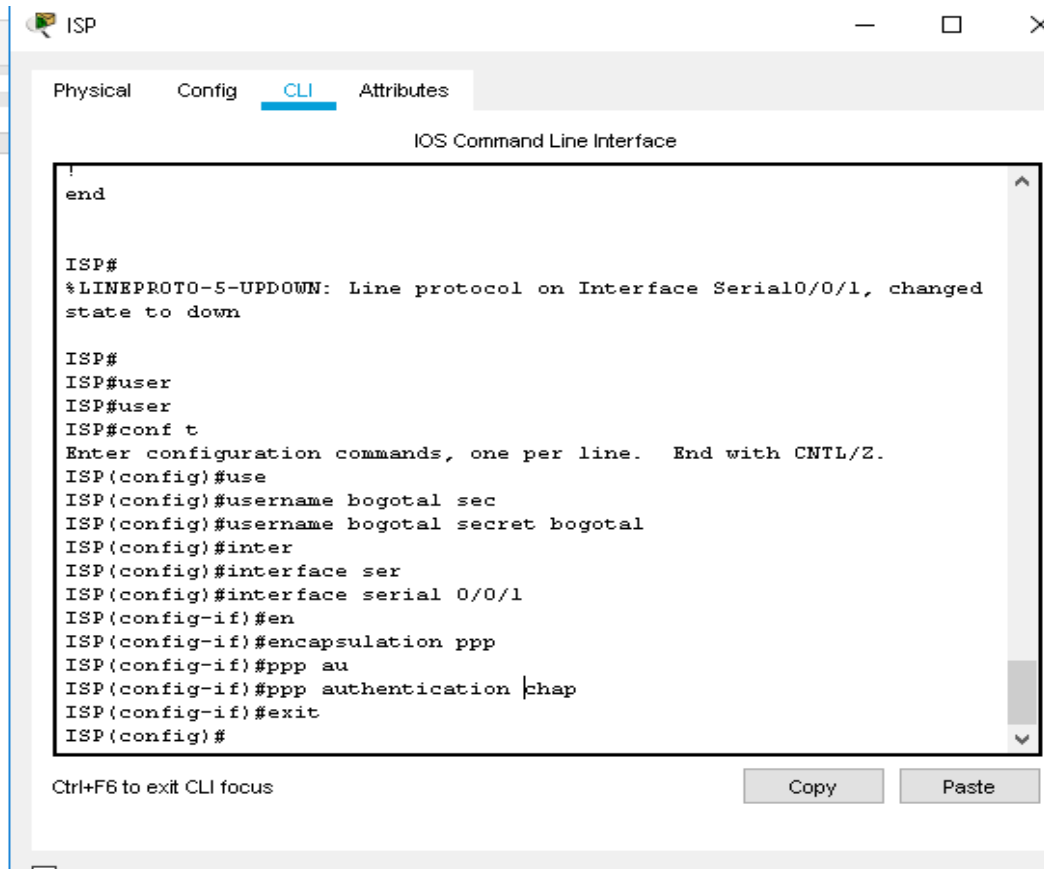
```
Bogota# conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Bogota(config)#inter
Bogota(config)#interface se
Bogota(config)#interface serial 0/0/1
Bogota(config-if)#user
Bogota(config-if)#exit
Bogota(config)#use
Bogota(config)#username ISP se
Bogota(config)#username ISP secret bogotal
Bogota(config)#inter
Bogota(config)#interface ser
Bogota(config)#interface serial 0/0/1
Bogota(config-if)#ppp un
Bogota(config-if)#ppp
Bogota(config-if)#ppp a
Bogota(config-if)#ppp authentication chap
Must set encapsulation to PPP before using PPP subcommands|
Bogota(config-if)#en
Bogota(config-if)#encapsulation ppp
Bogota(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to down
```

Ctrl+F6 to exit CLI focus

Copy Paste

Configuración enlace S0/0/1 con PPP y autenticación CHAP ISP

```
ISP(config)#username bogota1 secret bogota1
ISP(config)#interface serial 0/0/1
ISP(config-if)#encapsulation ppp
ISP(config-if)#ppp authentication chap
ISP(config-if)#exit
ISP(config)#
```



The screenshot shows a Cisco IOS Command Line Interface (CLI) window titled "ISP". The window has tabs for "Physical", "Config", "CLI", and "Attributes", with "CLI" selected. The main content area displays the following text:

```
!
end

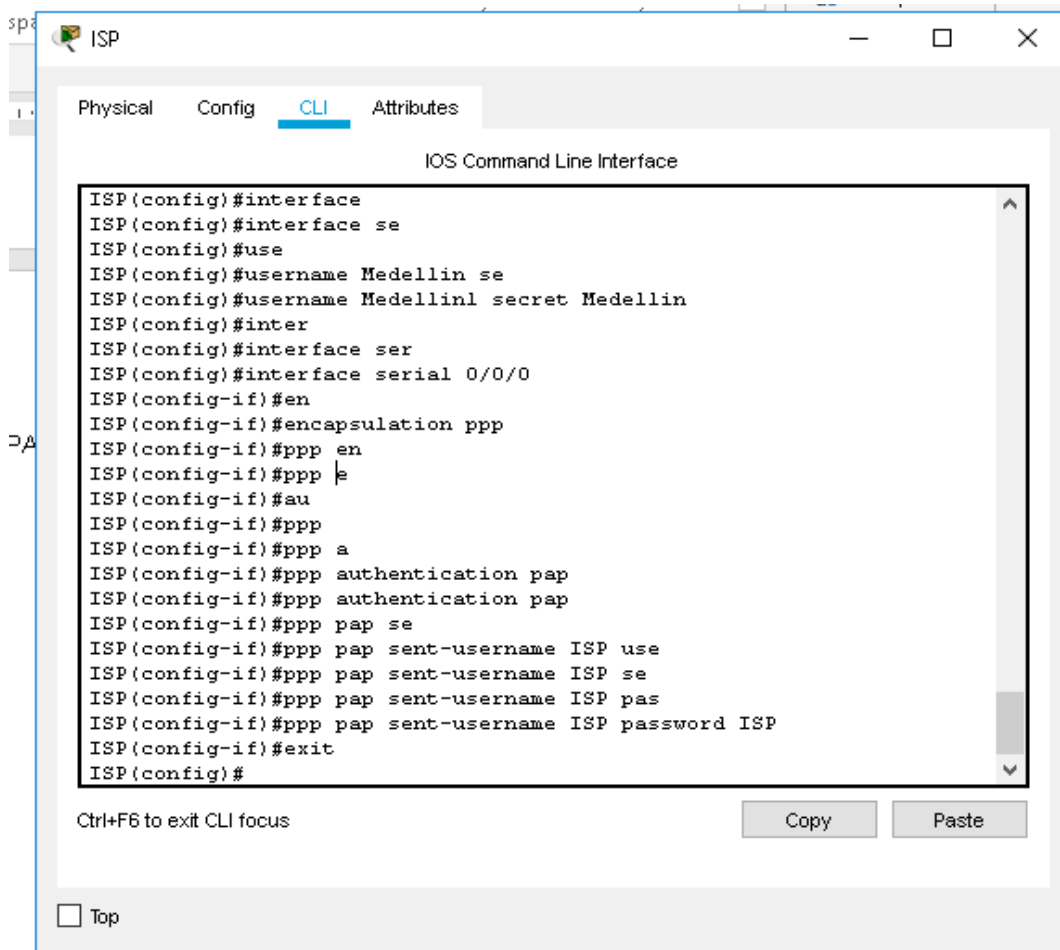
ISP#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to down

ISP#
ISP#user
ISP#user
ISP#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
ISP(config)#use
ISP(config)#username bogotal sec
ISP(config)#username bogotal secret bogotal
ISP(config)#inter
ISP(config)#interface ser
ISP(config)#interface serial 0/0/1
ISP(config-if)#en
ISP(config-if)#encapsulation ppp
ISP(config-if)#ppp au
ISP(config-if)#ppp authentication |chap
ISP(config-if)#exit
ISP(config)#
```

At the bottom of the window, there is a status bar with the text "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste".

Configuración enlace S0/0/0 con PPP y autenticación PAT en ISP

```
ISP(config)#username Medellin1 secret Medellin
ISP(config-if)#encapsulation ppp
ISP(config-if)#ppp authentication pap
ISP(config-if)#ppp pap sent-username ISP password ISP
ISP(config-if)#exit
```



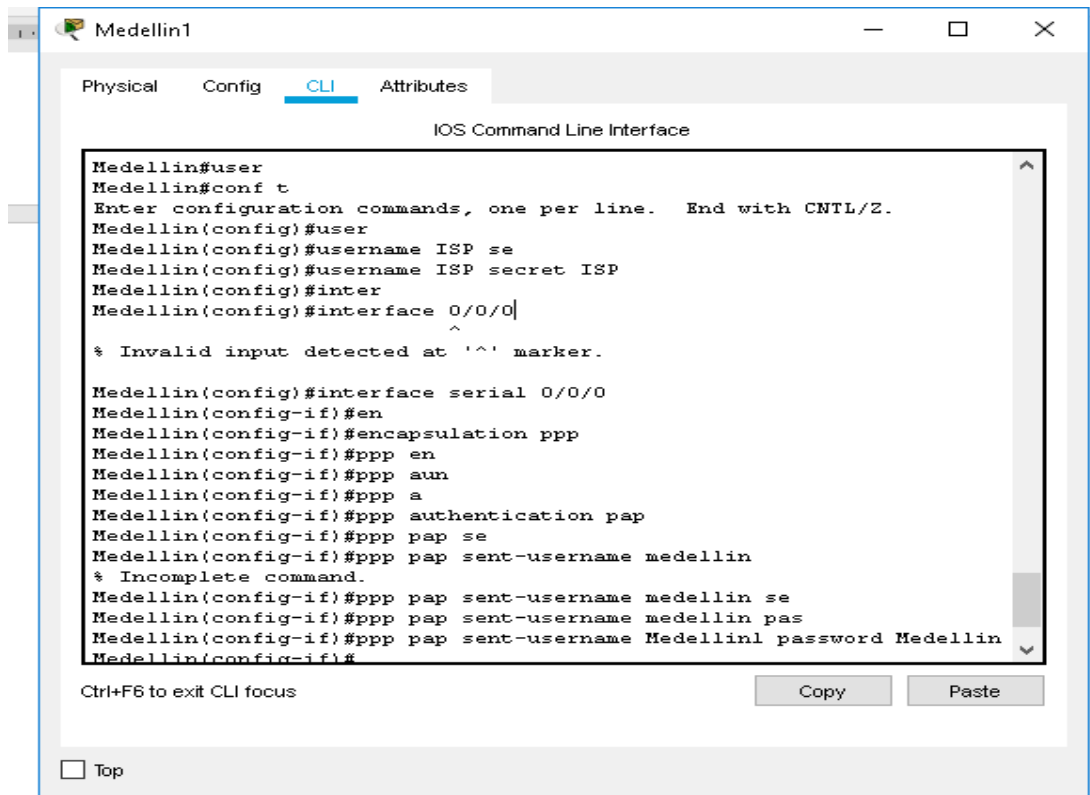
The screenshot shows a window titled "ISP" with a tabbed interface. The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following commands and their execution:

```
ISP(config)#interface
ISP(config)#interface se
ISP(config)#use
ISP(config)#username Medellin se
ISP(config)#username Medellin1 secret Medellin
ISP(config)#inter
ISP(config)#interface ser
ISP(config)#interface serial 0/0/0
ISP(config-if)#en
ISP(config-if)#encapsulation ppp
ISP(config-if)#ppp en
ISP(config-if)#ppp e
ISP(config-if)#au
ISP(config-if)#ppp
ISP(config-if)#ppp a
ISP(config-if)#ppp authentication pap
ISP(config-if)#ppp authentication pap
ISP(config-if)#ppp pap se
ISP(config-if)#ppp pap sent-username ISP use
ISP(config-if)#ppp pap sent-username ISP se
ISP(config-if)#ppp pap sent-username ISP pas
ISP(config-if)#ppp pap sent-username ISP password ISP
ISP(config-if)#exit
ISP(config)#
```

Below the terminal window, there is a "Ctrl+F6 to exit CLI focus" message and two buttons: "Copy" and "Paste". At the bottom left, there is a "Top" button with a checkbox.

Configuración enlace S0/0/0 con PPP y autenticación PAT en Medellin1

```
Medellin(config)#username ISP secret ISP
Medellin(config)#interface 0/0/0
Medellin(config)#interface serial 0/0/0
Medellin(config-if)#encapsulation ppp
Medellin(config-if)#ppp authentication pap
Medellin(config-if)#ppp pap sent-username Medellin1 password Medellin
Medellin(config-if)#
```



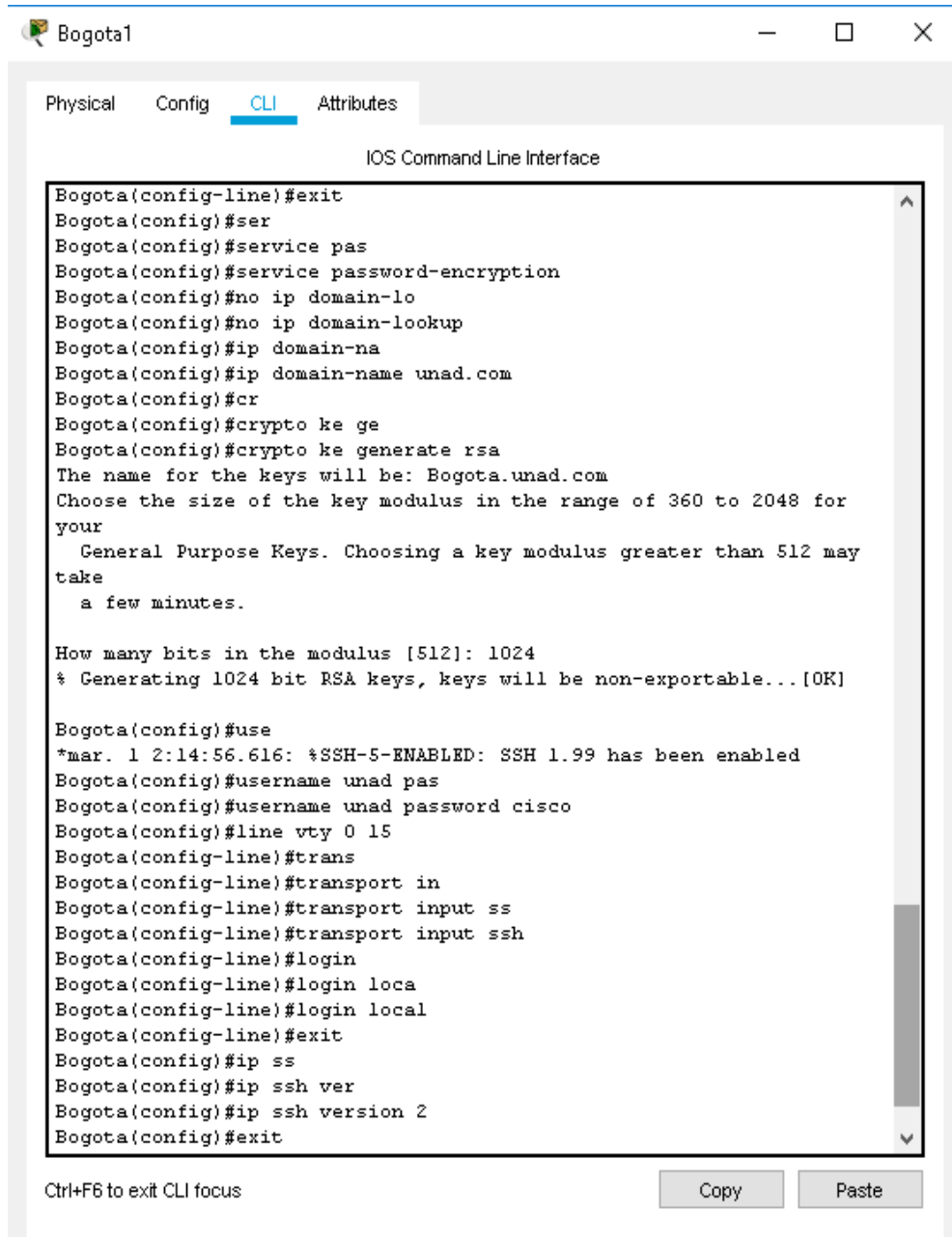
The screenshot shows a window titled "Medellin1" with a tabbed interface. The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following commands and responses:

```
Medellin#user
Medellin#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Medellin(config)#user
Medellin(config)#username ISP se
Medellin(config)#username ISP secret ISP
Medellin(config)#inter
Medellin(config)#interface 0/0/0|
      ^
% Invalid input detected at '^' marker.

Medellin(config)#interface serial 0/0/0
Medellin(config-if)#en
Medellin(config-if)#encapsulation ppp
Medellin(config-if)#ppp en
Medellin(config-if)#ppp aun
Medellin(config-if)#ppp a
Medellin(config-if)#ppp authentication pap
Medellin(config-if)#ppp pap se
Medellin(config-if)#ppp pap sent-username medellin
% Incomplete command.
Medellin(config-if)#ppp pap sent-username medellin se
Medellin(config-if)#ppp pap sent-username medellin pas
Medellin(config-if)#ppp pap sent-username Medellin1 password Medellin
Medellin(config-if)#
```

At the bottom of the CLI window, there is a "Ctrl+F6 to exit CLI focus" message, "Copy" and "Paste" buttons, and a "Top" button.

Configuración de líneas de consola y SSH para Router Bogota1



```
Bogota1
Physical Config CLI Attributes
IOS Command Line Interface
Bogota(config-line)#exit
Bogota(config)#ser
Bogota(config)#service pas
Bogota(config)#service password-encryption
Bogota(config)#no ip domain-lo
Bogota(config)#no ip domain-lookup
Bogota(config)#ip domain-na
Bogota(config)#ip domain-name unad.com
Bogota(config)#cr
Bogota(config)#crypto ke ge
Bogota(config)#crypto ke generate rsa
The name for the keys will be: Bogota.unad.com
Choose the size of the key modulus in the range of 360 to 2048 for
your
  General Purpose Keys. Choosing a key modulus greater than 512 may
take
  a few minutes.
How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]
Bogota(config)#use
*mar. 1 2:14:56.616: %SSH-5-ENABLED: SSH 1.99 has been enabled
Bogota(config)#username unad pas
Bogota(config)#username unad password cisco
Bogota(config)#line vty 0 15
Bogota(config-line)#trans
Bogota(config-line)#transport in
Bogota(config-line)#transport input ss
Bogota(config-line)#transport input ssh
Bogota(config-line)#login
Bogota(config-line)#login loca
Bogota(config-line)#login local
Bogota(config-line)#exit
Bogota(config)#ip ss
Bogota(config)#ip ssh ver
Bogota(config)#ip ssh version 2
Bogota(config)#exit
```

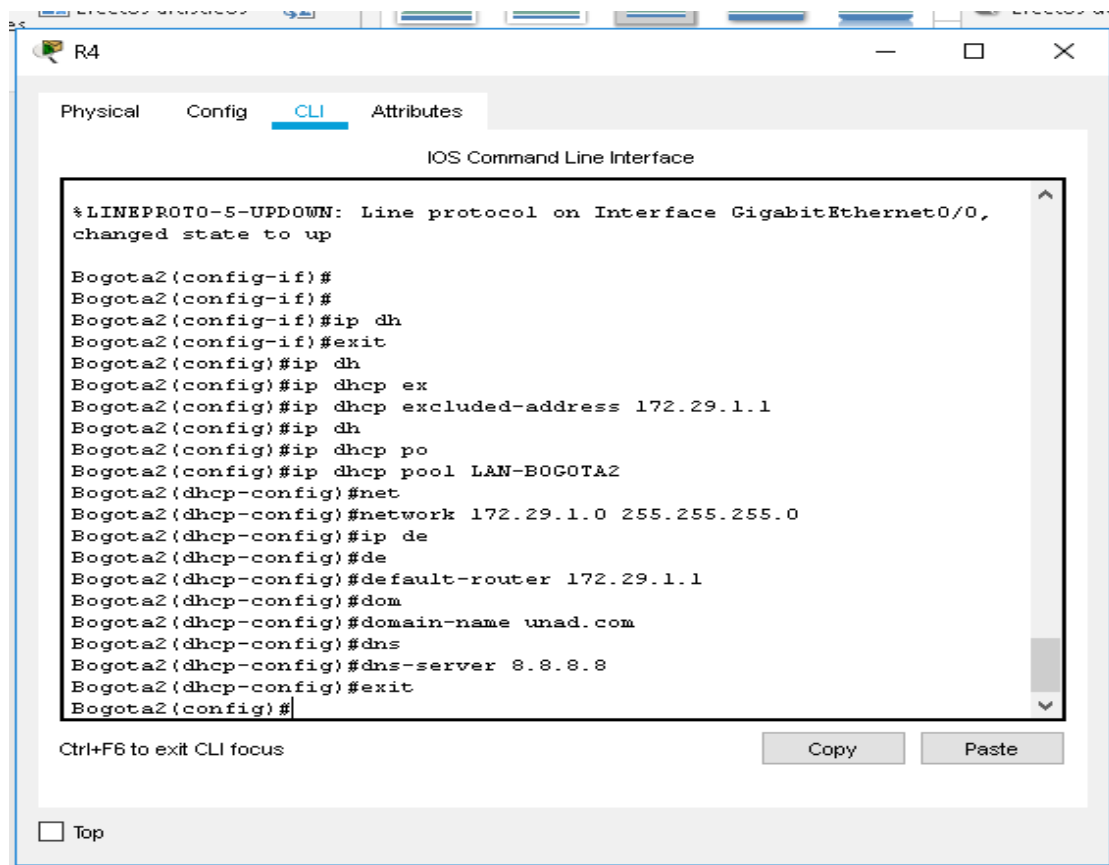
Ctrl+F6 to exit CLI focus

Copy Paste

a. Configurar la red Medellín2 y Medellín3 donde el router Medellín 2 debe ser el servidor DHCP para ambas redes Lan.

- b. El router Medellín3 deberá habilitar el paso de los mensajes broadcast hacia la IP del router Medellín2.
- c. Configurar la red Bogotá2 y Bogotá3 donde el router Medellín2 debe ser el servidor DHCP para ambas redes Lan.
- d. Configure el router Bogotá1 para que habilite el paso de los mensajes Broadcast hacia la IP del router Bogotá2.

Configuración DHCP en Router Bogota2

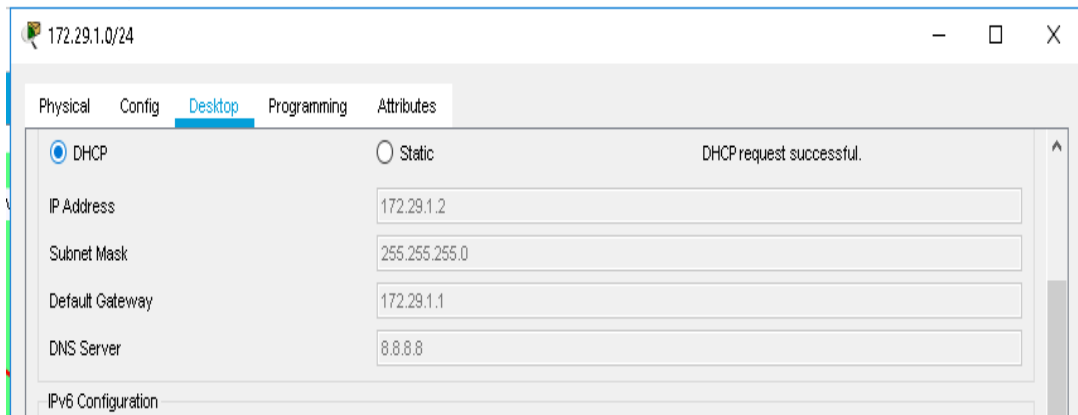


```
IOS Command Line Interface

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up

Bogota2(config-if)#
Bogota2(config-if)#
Bogota2(config-if)#ip dh
Bogota2(config-if)#exit
Bogota2(config)#ip dh
Bogota2(config)#ip dhcp ex
Bogota2(config)#ip dhcp excluded-address 172.29.1.1
Bogota2(config)#ip dh
Bogota2(config)#ip dhcp po
Bogota2(config)#ip dhcp pool LAN-BOGOTA2
Bogota2(dhcp-config)#net
Bogota2(dhcp-config)#network 172.29.1.0 255.255.255.0
Bogota2(dhcp-config)#ip de
Bogota2(dhcp-config)#de
Bogota2(dhcp-config)#default-router 172.29.1.1
Bogota2(dhcp-config)#dom
Bogota2(dhcp-config)#domain-name unad.com
Bogota2(dhcp-config)#dns
Bogota2(dhcp-config)#dns-server 8.8.8.8
Bogota2(dhcp-config)#exit
Bogota2(config)#
```

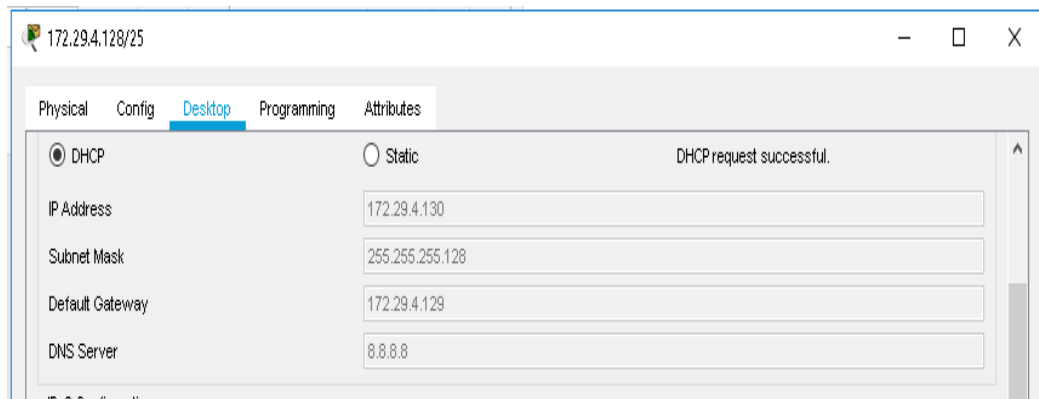
Se observa la configuración del host de la subred 172.29.1.0/24



Configuración DHCP en Router Medellin2

```
Medellin2(config)#no ip dhcp ex1
Medellin2(config)#no ip dhcp ex
Medellin2(config)#no ip dhcp excluded-address 172.29.2.129
Medellin2(config)#ip dh
Medellin2(config)#ip dhcp ex1
Medellin2(config)#ip dhcp e
Medellin2(config)#ip dhcp excluded-address 172.29.4.129
Medellin2(config)#ip dh
Medellin2(config)#ip dhcp poo
Medellin2(config)#ip dhcp pool LAN-MEDELLIN-2
Medellin2(dhcp-config)#net
Medellin2(dhcp-config)#network 172.29.4.128 255.255.255.128
Medellin2(dhcp-config)#de
Medellin2(dhcp-config)#default-router 172.29.4.129
Medellin2(dhcp-config)#do
Medellin2(dhcp-config)#domain-name unad.com
Medellin2(dhcp-config)#dn
Medellin2(dhcp-config)#dns-server 8.8.8.8
Medellin2(dhcp-config)#
```

Se observa la configuración del host de la subred 172.29.4.128/25



El router ISP deberá tener una ruta estática dirigida hacia cada red interna de Bogotá y Medellín para el caso se suman las subredes de cada uno a /22

```
ISP>enable
ISP#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ISP(config)#ip rou
ISP(config)#ip route
ISP(config)#ip route 172.29.4.0 255.255.252.0 serial 0/0/0
%Default route without gateway, if not a point-to-point interface,
may impact performance
ISP(config)#ip route 172.29.0.0 255.255.252.0 serial 0/0/1
%Default route without gateway, if not a point-to-point interface,
may impact performance
ISP(config)#ip route 172.29.4.128 255.255.255.128 serial 0/0/0
%Default route without gateway, if not a point-to-point interface,
may impact performance
ISP(config)#ip rou
ISP(config)#ip route 172.29.1.0 255.255.255.0 serial 0/0/1
%Default route without gateway, if not a point-to-point interface,
may impact performance
ISP(config)#
```

Configuración

```
ISP(config)#ip route 172.29.4.0 255.255.252.0 serial 0/0/0
ISP(config)#ip route 172.29.0.0 255.255.252.0 serial 0/0/1
ISP(config)#ip route 172.29.4.128 255.255.255.128 serial 0/0/0
ISP(config)#ip route 172.29.1.0 255.255.255.0 serial 0/0/1
```

Los routers Bogota1 y Medellín1 deberán añadir a su configuración de enrutamiento una ruta por defecto hacia el ISP y, a su vez, redistribuirla dentro de las publicaciones de RIP

```
!
!
!
end

Medellin# conf t
Enter configuration commands, one per line. End with CNTL/Z.
Medellin(config)#ip route
Medellin(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.6
Medellin(config)#
```

Configuración

```
Medellin(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.6
Medellin(config)#
```

```
Password:
Bogota>enable
Password: |
Bogota#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.10
Bogota(config)#
```

Ctrl+F6 to exit CLI focus

Top

Configuración

```
Bogota(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.10
```

Para no propagar las publicaciones por interfaces que no lo requieran se debe deshabilitar la propagación del protocolo RIP,

Router Medellín 1

```
-----
Medellin>enable
Password:
Medellin#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Medellin(config)#route rip
Medellin(config-router)#version 2
Medellin(config-router)#pas
Medellin(config-router)#passive-interface 0/1/1
^
% Invalid input detected at '^' marker.
Medellin(config-router)#passive-interface se
Medellin(config-router)#passive-interface serial 0/1/1
Medellin(config-router)#
Medellin#
*SYS-5-CONFIG_I: Configured from console by console
Medellin#
```

Ctrl+F6 to exit CLI focus

Copy Paste

```
Medellin(config)#route rip
Medellin(config-router)#version 2
Medellin(config-router)#passive-interface 0/1/1
Medellin(config-router)#passive-interface serial 0/1/1
```

Router Medellín 2

```
^
% Invalid input detected at '^' marker.
Medellin2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Medellin2(config)#router rip
Medellin2(config-router)#version 2
Medellin2(config-router)#pas
Medellin2(config-router)#passive-interface gi
Medellin2(config-router)#passive-interface gigabitEthernet 0/0
Medellin2(config-router)#
```

9

Ctrl+F6 to exit CLI focus

Copy Paste

```
Medellin2(config)#router rip
Medellin2(config-router)#version 2
Medellin2(config-router)#pas
Medellin2(config-router)#passive-interface gigabitEthernet 0/0
```

Router Medellín 3

```

-----
Medellin3>enable
Password:
Medellin3#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Medellin3(config)#router rip
Medellin3(config-router)#version 2
Medellin3(config-router)#pas
Medellin3(config-router)#passive-interface gi
Medellin3(config-router)#passive-interface gigabitEthernet 0/0
Medellin3(config-router)#

```

```

Medellin3(config)#router rip
Medellin3(config-router)#version 2
Medellin3(config-router)#passive-interface gigabitEthernet 0/0

```

Router Bogotá 1

```

^
% Invalid input detected at '^' marker.

Bogota#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Bogota(config)#router rip
Bogota(config-router)#version 2
Bogota(config-router)#pas
Bogota(config-router)#passive-interface 0/0/0
^
% Invalid input detected at '^' marker.

Bogota(config-router)#passive-interface serial 0/0/0
Bogota(config-router)#

```

```

Bogota(config)#router rip
Bogota(config-router)#version 2
Bogota(config-router)#passive-interface serial 0/0/0

```

Router Bogotá 2

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to up
Porfavor salga inmediatamente del dispositivo, ya que le puede
ocasionar implicaciones penales

User Access Verification

Password:
Password:

Bogota2>enable
Password:
Password:
Bogota2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Bogota2(config)#router rip
Bogota2(config-router)#version 2
Bogota2(config-router)#pas
Bogota2(config-router)#passive-interface se
Bogota2(config-router)#passive-interface serial 0/1/1
Bogota2(config-router)#
```

```
Bogota2(config)#router rip
Bogota2(config-router)#version 2
Bogota2(config-router)#passive-interface serial 0/1/1
```

```
Bogota2(config)#router rip
Bogota2(config-router)#version 2
Bogota2(config-router)#pas
Bogota2(config-router)#passive-interface gi
Bogota2(config-router)#passive-interface gigabitEthernet 0/0
Bogota2(config-router)#
```

```
Bogota2(config-router)#version 2
Bogota2(config-router)#passive-interface gigabitEthernet 0/0
```

Router Bogotá 3

```
Bogota3>enable
Password:
Bogota3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Bogota3(config)#router rip
Bogota3(config-router)#version 2
Bogota3(config-router)#pas
Bogota3(config-router)#passive-interface gi
Bogota3(config-router)#passive-interface gigabitEthernet 0/0
Bogota3(config-router)#
```

```
Bogota3(config)#router rip
Bogota3(config-router)#version 2
Bogota3(config-router)#passive-interface gigabitEthernet 0/0
```

Verificación del protocolo RIP.

- Verificar y documentar las opciones de enrutamiento configuradas en los routers, como el **passive interface** para la conexión hacia el ISP, la versión de RIP y las interfaces que participan de la publicación entre otros datos.
- Verificar y documentar la base de datos de RIP de cada router, donde se informa de manera detallada de todas las rutas hacia cada red.

Rutas de Medellín 1

```

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
R    172.29.4.0/25 [120/1] via 172.29.6.2, 00:00:05, Serial0/1/0
R    172.29.4.128/25 [120/1] via 172.29.6.13, 00:00:11,
Serial0/0/1
C    172.29.6.0/30 [120/1] via 172.29.6.9, 00:00:11, Serial0/1/1
L    172.29.6.1/32 is directly connected, Serial0/1/0
R    172.29.6.4/30 [120/1] via 172.29.6.2, 00:00:05, Serial0/1/0
    [120/1] via 172.29.6.13, 00:00:11, Serial0/0/1
    [120/1] via 172.29.6.9, 00:00:11, Serial0/1/1
C    172.29.6.8/30 is directly connected, Serial0/1/1
L    172.29.6.10/32 is directly connected, Serial0/1/1
C    172.29.6.12/30 is directly connected, Serial0/0/1
L    172.29.6.14/32 is directly connected, Serial0/0/1

Medellin#
```


Rutas de Medellín 2

```
Gateway of last resort is not set

172.29.0.0/16 is variably subnetted, 10 subnets, 3 masks
R   172.29.4.0/25 [120/1] via 172.29.6.5, 00:00:16, Serial0/0/0
C   172.29.4.128/25 is directly connected, GigabitEthernet0/0
L   172.29.4.129/32 is directly connected, GigabitEthernet0/0
R   172.29.6.0/30 [120/1] via 172.29.6.14, 00:00:29, Serial0/0/1
    [120/1] via 172.29.6.5, 00:00:16, Serial0/0/0
C   172.29.6.4/30 is directly connected, Serial0/0/0
L   172.29.6.6/32 is directly connected, Serial0/0/0
C   172.29.6.8/30 is directly connected, Serial0/1/1
L   172.29.6.9/32 is directly connected, Serial0/1/1
C   172.29.6.12/30 is directly connected, Serial0/0/1
L   172.29.6.13/32 is directly connected, Serial0/0/1

Medellin2#
```

Rutas de Medellín 3

```
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
C   172.29.4.0/25 is directly connected, GigabitEthernet0/0
L   172.29.4.1/32 is directly connected, GigabitEthernet0/0
R   172.29.4.128/25 [120/1] via 172.29.6.6, 00:00:30, Serial0/0/0
C   172.29.6.0/30 is directly connected, Serial0/1/0
L   172.29.6.2/32 is directly connected, Serial0/1/0
C   172.29.6.4/30 is directly connected, Serial0/0/0
L   172.29.6.5/32 is directly connected, Serial0/0/0
R   172.29.6.8/30 [120/1] via 172.29.6.1, 00:00:06, Serial0/1/0
    [120/1] via 172.29.6.6, 00:00:30, Serial0/0/0
R   172.29.6.12/30 [120/1] via 172.29.6.6, 00:00:30, Serial0/0/0
    [120/1] via 172.29.6.1, 00:00:06, Serial0/1/0

Medellin3#
```

Rutas de Bogotá 1

```
Bogota#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B -
BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

172.28.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 172.28.3.8/30 is directly connected, Serial0/0/0
L 172.28.3.9/32 is directly connected, Serial0/0/0
172.29.0.0/16 is variably subnetted, 6 subnets, 3 masks
R 172.29.0.0/24 [120/1] via 172.29.3.6, 00:00:08, Serial0/1/0
R 172.29.1.0/24 [120/2] via 172.29.3.6, 00:00:08, Serial0/1/0
R 172.29.3.0/30 [120/1] via 172.29.3.6, 00:00:08, Serial0/1/0
C 172.29.3.4/30 is directly connected, Serial0/1/0
L 172.29.3.5/32 is directly connected, Serial0/1/0
R 172.29.3.12/30 [120/1] via 172.29.3.6, 00:00:08, Serial0/1/0

Bogota#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

Rutas de Bogotá 2

```
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B -
BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

172.28.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 172.28.3.8/30 is directly connected, Serial0/1/1
L 172.28.3.10/32 is directly connected, Serial0/1/1
172.29.0.0/16 is variably subnetted, 7 subnets, 3 masks
R 172.29.0.0/24 [120/1] via 172.29.3.13, 00:00:02, Serial0/0/1
C 172.29.1.0/24 is directly connected, GigabitEthernet0/0
L 172.29.1.1/32 is directly connected, GigabitEthernet0/0
R 172.29.3.0/30 [120/1] via 172.29.3.13, 00:00:02, Serial0/0/1
R 172.29.3.4/30 [120/1] via 172.29.3.13, 00:00:02, Serial0/0/1
C 172.29.3.12/30 is directly connected, Serial0/0/1
L 172.29.3.14/32 is directly connected, Serial0/0/1

Bogota2#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Rutas de Bogotá 3

```
Bogota3#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, E -
EGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
I - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
C    172.29.0.0/24 is directly connected, GigabitEthernet0/0
L    172.29.0.1/32 is directly connected, GigabitEthernet0/0
R    172.29.1.0/24 [120/1] via 172.29.3.14, 00:00:23, Serial0/0/1
C    172.29.3.0/30 is directly connected, Serial0/0/0
L    172.29.3.2/32 is directly connected, Serial0/0/0
C    172.29.3.4/30 is directly connected, Serial0/1/0
L    172.29.3.6/32 is directly connected, Serial0/1/0
C    172.29.3.12/30 is directly connected, Serial0/0/1
L    172.29.3.13/32 is directly connected, Serial0/0/1

Bogota3#
```

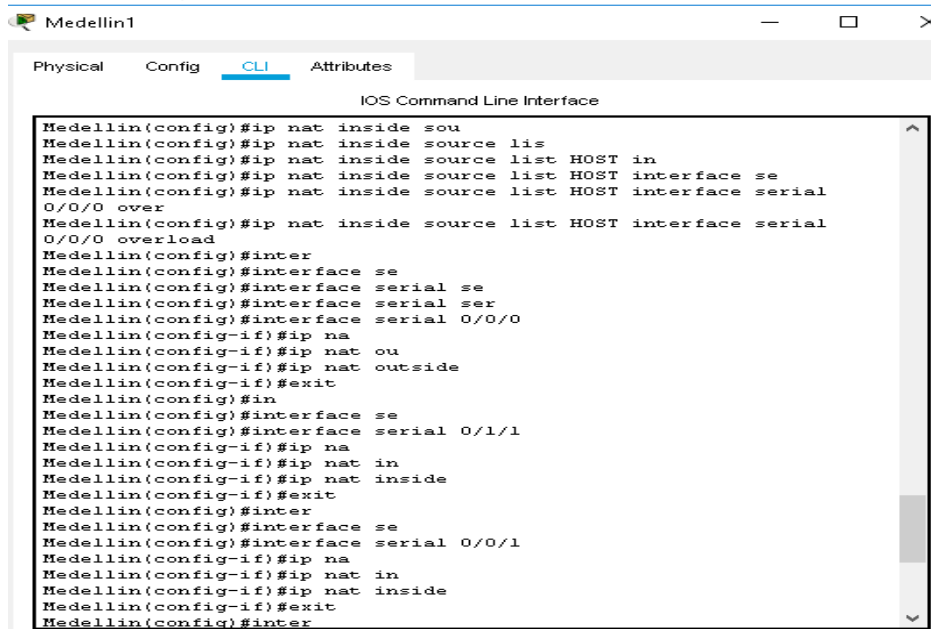
a. En la topología, si se activa NAT en cada equipo de salida (Bogotá1 y Medellín1), los routers internos de una ciudad no podrán llegar hasta los routers internos en el otro extremo, sólo existirá comunicación hasta los routers Bogotá1, ISP y Medellín1.

b. Después de verificar lo indicado en el paso anterior proceda a configurar el NAT en el router Medellín1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del router Medellín1, cómo diferente puerto.

Proceda a configurar el NAT en el router Bogotá1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del router Bogotá1, cómo diferente puerto

Configuración NAT en medellin1

```
Medellin(config)#ip access-list standard HOST
Medellin(config-std-nacl)#per
Medellin(config-std-nacl)#permit 172.29.4.0 0.0.0.255
nfig)#interface serial 0/0/0
Medellin(config-if)#ip na
Medellin(config-if)#ip nat ou
Medellin(config-if)#ip nat outside
Medellin(config-if)#exit
Medellin(config)#interface serial 0/1/1
Medellin(config-if)#ip nat inside
Medellin(config-if)#exit
Medellin(config)#interface serial 0/0/1
Medellin(config-if)#ip nat inside
Medellin(config-if)#exit
Medellin(config)#interface serial 0/1/0
Medellin(config-if)#ip nat inside
Medellin(config-if)#exit
```



The screenshot shows a Cisco IOS Command Line Interface window titled "Medellin1". The window has tabs for "Physical", "Config", "CLI", and "Attributes", with "CLI" selected. The main area displays the following configuration commands:

```
Medellin(config)#ip nat inside sou
Medellin(config)#ip nat inside source lis
Medellin(config)#ip nat inside source list HOST in
Medellin(config)#ip nat inside source list HOST interface se
Medellin(config)#ip nat inside source list HOST interface serial
0/0/0 over
Medellin(config)#ip nat inside source list HOST interface serial
0/0/0 overload
Medellin(config)#inter
Medellin(config)#interface se
Medellin(config)#interface serial se
Medellin(config)#interface serial ser
Medellin(config)#interface serial 0/0/0
Medellin(config-if)#ip na
Medellin(config-if)#ip nat ou
Medellin(config-if)#ip nat outside
Medellin(config-if)#exit
Medellin(config)#in
Medellin(config)#interface se
Medellin(config)#interface serial 0/1/1
Medellin(config-if)#ip na
Medellin(config-if)#ip nat in
Medellin(config-if)#ip nat inside
Medellin(config-if)#exit
Medellin(config)#inter
Medellin(config)#interface se
Medellin(config)#interface serial 0/0/1
Medellin(config-if)#ip na
Medellin(config-if)#ip nat in
Medellin(config-if)#ip nat inside
Medellin(config-if)#exit
Medellin(config)#inter
```

Configuración NAT en Bogota1

```
Bogota(config)#ip access-list standard HOST
Bogota(config-std-nacl)#perm
Bogota(config-std-nacl)#permit 172.29.0.0 0.0.0.255
Bogota(config-std-nacl)#exit
```

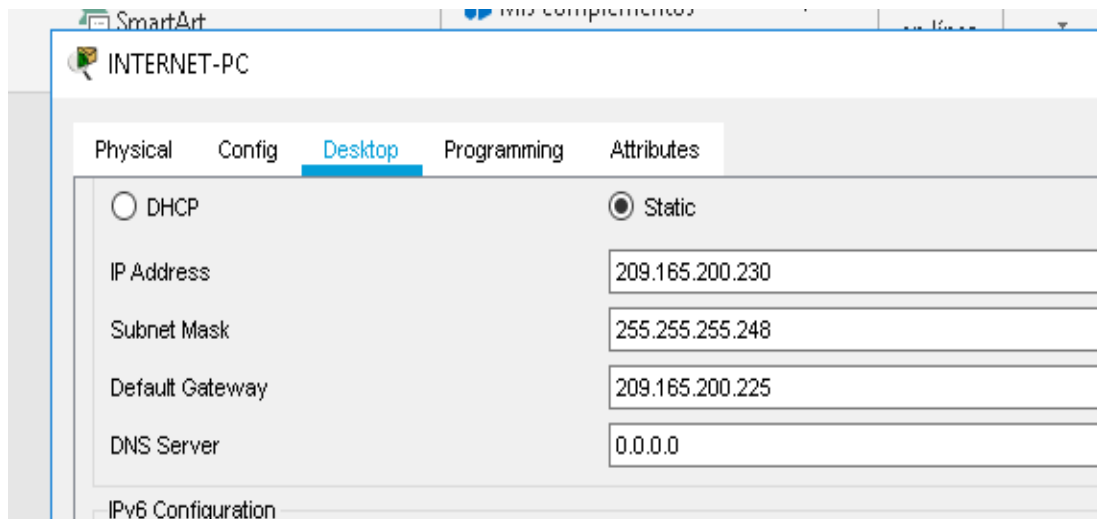
```
Bogota(config)#ip nat inside source list HOST interface serial 0/0/1 overload
Bogota(config)#inter
Bogota(config)#interface se
Bogota(config)#interface serial 0/0/1
Bogota(config-if)#ip nat outside
Bogota(config-if)#exit
Bogota(config)#interface serial 0/0/0
Bogota(config-if)#ip nat inside
Bogota(config-if)#exit
Bogota(config)#interface serial 0/1/1
Bogota(config-if)#ip nat inside
Bogota(config-if)#exit
Bogota(config)#interface serial 0/1/0
Bogota(config-if)#ip nat inside
Bogota(config-if)#exit
```

```
Bogota(config)#ip nat inside so
Bogota(config)#ip nat inside source list
Bogota(config)#ip nat inside source list HOST inter
Bogota(config)#ip nat inside source list HOST interface se
Bogota(config)#ip nat inside source list HOST interface serial 0/0/1 over
Bogota(config)#ip nat inside source list HOST interface serial 0/0/1 overload
Bogota(config)#inter
Bogota(config)#interface se
Bogota(config)#interface serial 0/0/1
Bogota(config-if)#ip nat
Bogota(config-if)#ip nat ou
Bogota(config-if)#ip nat outside
Bogota(config-if)#in
Bogota(config-if)#exit
Bogota(config)#inter
Bogota(config)#interface se
Bogota(config)#interface serial 0/0/0
Bogota(config-if)#ip na
Bogota(config-if)#ip nat inse
Bogota(config-if)#ip nat in
Bogota(config-if)#ip nat inside
Bogota(config-if)#exit
Bogota(config)#inter
Bogota(config)#interface s
Bogota(config)#interface serial 0/1/1
Bogota(config-if)#ip nat
Bogota(config-if)#ip nat inse
Bogota(config-if)#ip nat in
Bogota(config-if)#ip nat inside
Bogota(config-if)#exit
Bogota(config)#inter
Bogota(config)#interface se
Bogota(config)#interface serial 0/1/0
Bogota(config-if)#ip nat
Bogota(config-if)#ip nat inse
Bogota(config-if)#ip nat in
Bogota(config-if)#ip nat inside
Bogota(config-if)#exit
Bogota(config)#
```

Ctrl+F6 to exit CLI focus

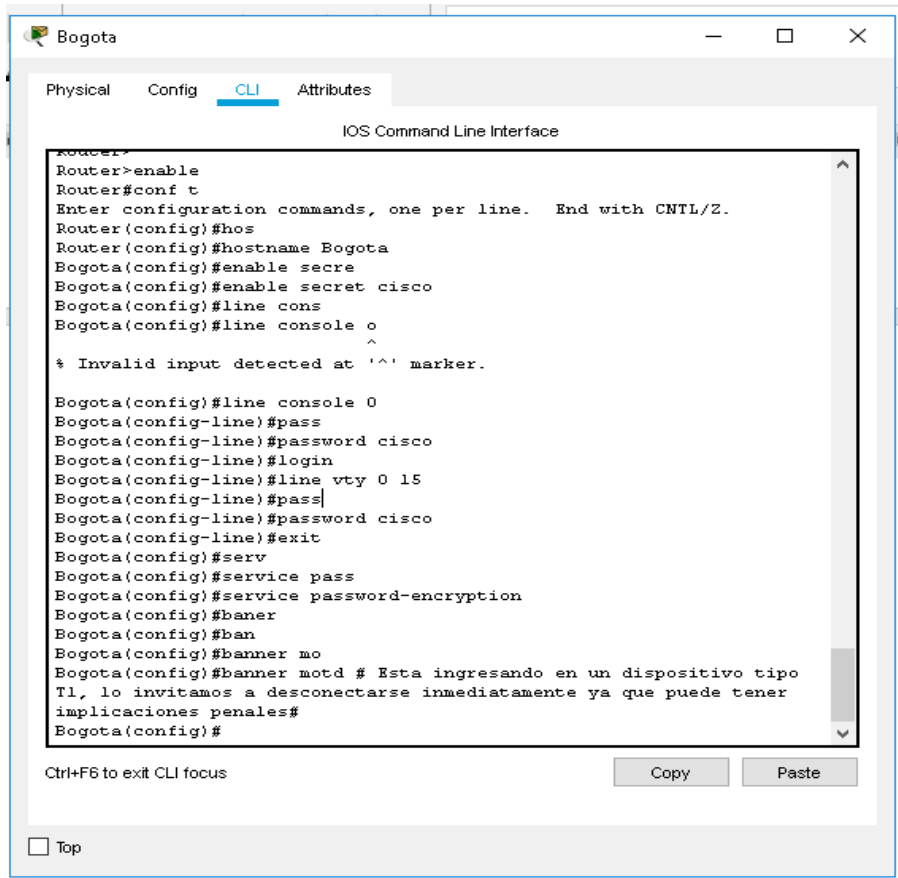
Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario

Se procederá a configurar el PC-INTERNET



Realizare la configuración básica de seguridad en le router 1 BOGOTA

```
Bogota(config)#enable secret cisco
Bogota(config)#line console 0
Bogota(config-line)#pass
Bogota(config-line)#password cisco
Bogota(config-line)#login
Bogota(config-line)#line vty 0 15
Bogota(config-line)#password cisco
Bogota(config-line)#exit
-encryption
Bogota(config)#banner motd # Esta ingresando en un dispositivo tipo T1, lo
invitamos a desconectarse inmediatamente ya que puede tener
```



```
Bogota(config)#username unad se
Bogota(config)#username unad secret cisco
Bogota(config)#line vty 0 15
Bogota(config-line)#in
Bogota(config-line)#trans
Bogota(config-line)#transport in
Bogota(config-line)#transport input ssh
Bogota(config-line)#transport input ssh
Bogota(config-line)#login local
Bogota(config-line)#exec-timeout 55
Bogota(config-line)#exit
Bogota(config)#ip ssh version 2
Bogota(config)#exit
```



```

Bogota(config-line)#?
Bogota(config-line)#?
Virtual Line configuration commands:
access-class      Filter connections based on an IP access list
accounting        Accounting parameters
databits          Set number of data bits per character
exec-timeout      Set the EXEC timeout
exit              Exit from line configuration mode|
flowcontrol       Set the flow control
history           Enable and control the command history function
ipv6              IPv6 options
logging           Modify message logging facilities
login             Enable password checking
motd-banner       Enable the display of the MOTD banner
no               Negate a command or set its defaults
parity            Set terminal parity
password          Set a password
privilege         Change privilege level for line
session-limit     Set maximum number of sessions
speed            Set the transmit and receive speeds
stopbits         Set async line stop bits
transport         Define transport protocols for line
Bogota(config-line)#ex
Bogota(config-line)#exec
Bogota(config-line)#exec-timeout 55
Bogota(config-line)#exit
Bogota(config)#ip ssh
Bogota(config)#ip ssh verion
Bogota(config)#ip ssh version 2
      ^
% Invalid input detected at '^' marker.

Bogota(config)#ip ss
Bogota(config)#ip ssh vers
Bogota(config)#ip ssh version 2
Bogota(config)#exit
Bogota#
%SYS-5-CONFIG_I: Configured from console by console

```

Ctrl-ESC to exit CLI focus

Configuramos el serial en S0/0/0 del router Bogotá

```

Bogota(config)#interface serial 0/0/0
Bogota(config-if)#ip address 172.31.21.1 255.255.255.252
Bogota(config-if)#description ENLACE AL ROUTER MIAMI
Bogota(config-if)#clock rate 128000
Bogota(config-if)#no shutdown

```

```
Bogota
Physical Config CLI Attributes
IOS Command Line Interface
Bogota(config)#ip ssh
Bogota(config)#ip ssh version
Bogota(config)#ip ssh version 2
^
% Invalid input detected at '^' marker.
Bogota(config)#ip ss
Bogota(config)#ip ssh vers
Bogota(config)#ip ssh version 2
Bogota(config)#exit
Bogota#
%SYS-5-CONFIG_I: Configured from console by console
Bogota#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#interface serial 0/0/0
Bogota(config-if)#ip address 172.31.21.1 255.255.255.252
Bogota(config-if)#description ENLACE AL ROUTER MIAMI
Bogota(config-if)#clock rate 128000
Bogota(config-if)#no sh
Bogota(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Bogota(config-if)#
```

Crear una ruta predeterminada para llegar al router miami

```
Bogota(config-if)#exit
Bogota(config)#ip route 0.0.0.0 0.0.0.0 serial
```

```
Bogota(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Bogota(config-if)#
Bogota(config-if)#
Bogota(config-if)#exit
Bogota(config)#ip route 0.0.0.0 0.0.0.0 serial
Ctrl+F6 to exit CLI focus
Copy Paste
```

Realizare la configuración básica de seguridad en le router 2 MIAMI

```
Router(config)#line console 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#enable secret cisco
Router(config)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#exit
Router(config)#service password-encryption
Router(config)#ip domain-name unad.com
```

```
Router(config)#crypto key generate rsa
% Please define a hostname other than Router.
Router(config)#hostname Miami
Miami(config)#crypto key generate rsa
Miami(config)#username unad secret cisco
Miami(config)#line vty 0 15
Miami(config-line)#transport input ssh
Miami(config-line)#login local
Miami(config-line)#exit
Miami(config)#ip ssh version 2
Miami(config)#exit
```

```
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#line cons
Router(config)#line console 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#enable secret cisco
Router(config)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#exit
Router(config)#service password-encri
Router(config)#service passw
Router(config)#service password-encryption
Router(config)#ip domain-name unad.com
Router(config)#crypto key generate rsa
% Please define a hostname other than Router.
Router(config)#hostname Miami
Miami(config)#crypto key generate rsa
The name for the keys will be: Miami.unad.com
Choose the size of the key modulus in the range of 360 to 2048 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.

How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]

Miami(config)#username unad secret cisco
*mar. 3 22:9:23.841: %SSH-5-ENABLED: SSH 1.99 has been enabled
Miami(config)#line vty 0 15
Miami(config-line)#transport input ssh
Miami(config-line)#login local
Miami(config-line)#exit
Miami(config)#ip ssh version 2
Miami(config)#exit
Miami#
%SYS-5-CONFIG_I: Configured from console by console
```

Out-55 to out-55 cli from

Configuración del enlace entre Miami y Bogotá 0/0/1

```
Miami(config)#interface serial 0/0/1
Miami(config-if)#ip address 172.31.21.2 255.255.255.252
Miami(config-if)#no shutdown
```

```

Miami#config t
Enter configuration commands, one per line. End with CNTL/Z.
Miami(config)#interface serial 0/0/1
Miami(config-if)#ip address 172.31.21.2 255.255.255.252
Miami(config-if)#no shutdown

Miami(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

Miami(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to up

```

Configuración del enlace entre Miami y Buenos aires 0/0/0

```

Miami(config)#INTERface serial 0/0/0
Miami(config-if)#ip address 172.31.23.1 255.255.255.252
Miami(config-if)#clock rate 128000
Miami(config-if)#no shut
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Miami(config-if)#des
Miami(config-if)#description SERIAL A BUENOS AIRES

```

```

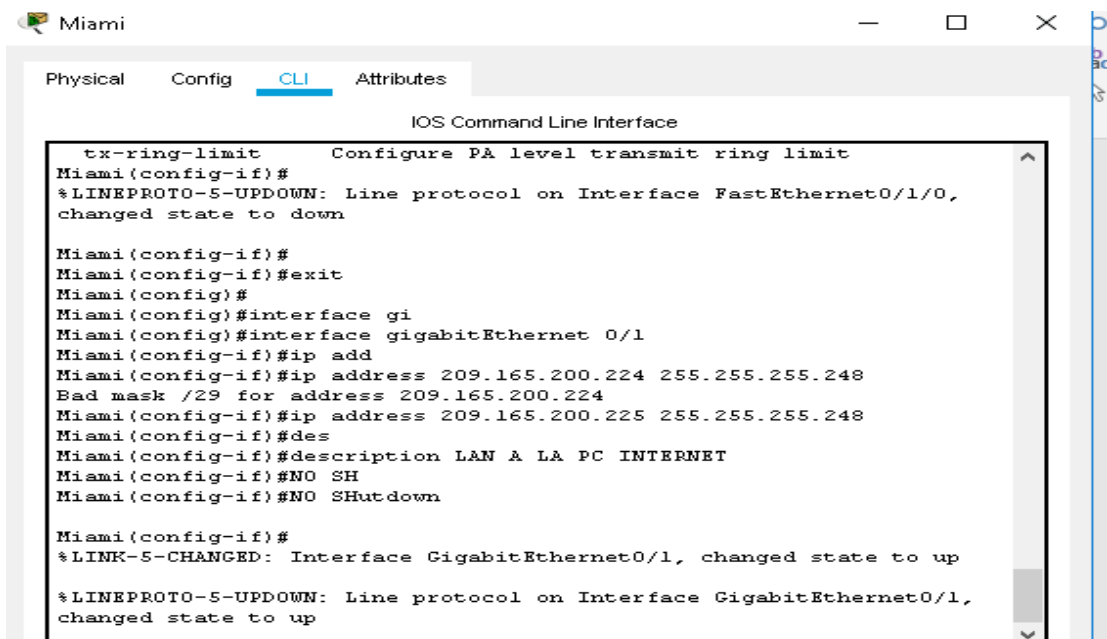
Miami(config)#
Miami(config)#INTER
Miami(config)#INTERface ser
Miami(config)#INTERface serial 0/0/0
Miami(config-if)#ip add
Miami(config-if)#ip address 172.31.23.1 255.255.255.252
Miami(config-if)#clock rate 128000
Miami(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Miami(config-if)#des
Miami(config-if)#description SERIAL A BUENOS AIRES
Miami(config-if)#

```

Configuración entre Miami y el PC-INTERNET G0/1

```
Miami(config)#interface gigabitEthernet 0/1
Miami(config-if)#ip address 209.165.200.225 255.255.255.248
Miami(config-if)#description LAN A LA PC INTERNET
Miami(config-if)#NO SHUTDOWN
```



The screenshot shows a window titled "Miami" with a tabbed interface. The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following sequence of commands and responses:

```
tx-ring-limit      Configure PA level transmit ring limit
Miami(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1/0,
changed state to down

Miami(config-if)#
Miami(config-if)#exit
Miami(config)#
Miami(config)#interface gi
Miami(config)#interface gigabitEthernet 0/1
Miami(config-if)#ip add
Miami(config-if)#ip address 209.165.200.224 255.255.255.248
Bad mask /29 for address 209.165.200.224
Miami(config-if)#ip address 209.165.200.225 255.255.255.248
Miami(config-if)#des
Miami(config-if)#description LAN A LA PC INTERNET
Miami(config-if)#NO SH
Miami(config-if)#NO SHUTDOWN

Miami(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1,
changed state to up
```

Configuración entre MIAMI y el Web server

```
Miami(config)#interface gigabitEthernet 0/0
Miami(config-if)#ip address 10.10.10.1 255.255.255.0
Miami(config-if)#description LAN DEL WEB-SERVER
Miami(config-if)#NO SHUTDOWN
```

```
Miami(config-if)#
Miami(config-if)#exit
Miami(config)#
Miami(config)#inter
Miami(config)#interface gi
Miami(config)#interface gigabitEthernet 0/0
Miami(config-if)#ip add
Miami(config-if)#ip address 10.10.10.1 255.255.255.0
Miami(config-if)#des
Miami(config-if)#description LAN DEL WEB-SERVER
Miami(config-if)#NO SH
Miami(config-if)#NO SHUTDOWN

Miami(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up
```

Configuración del router Buenos aires

```
Router(config)#no ip domain-lookup
Router(config)#enable secret cisco
Router(config)#line console 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#exit
Router(config)#service password-
Router(config)#service password-encryption
Router(config)#ip domain-loo
Router(config)#ip domain-name unad.com
Router(config)#crypto key generate rsa
Router(config)#hostname Buenosaires
Buenosaires(config)#crypto key generate rsa
The name for the keys will be: Buenosaires.unad.com
Choose the size of the key modulus in the range of 360 to 2048 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.
```

```
How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]
```

```
Buenosaires(config)#username unad secret cisco
*mar. 3 22:57:21.134: %SSH-5-ENABLED: SSH 1.99 has been enabled
Buenosaires(config)#line vty 0 15
Buenosaires(config-line)#transport input ssh
Buenosaires(config-line)#login local
Buenosaires(config-line)#exit
Buenosaires(config)#ip ssh version 2
Buenosaires(config)#exit
Buenosaires#
Buenosaires(config)#banner motd # Esta ingresando en un dispositivo tipo T1, lo
invitamos a desconectarse inmediatamente ya que puede tener implicaciones
penales #
```



```
Buenos Aires
Physical  Config  CLI  Attributes
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#enable secret cisco
Router(config)#line console 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#exit
Router(config)#service password-
Router(config)#ip domain-loc
Router(config)#ip domain-name unad.com
Router(config)#crypto key generate rsa
% Please define a hostname other than Router.
Router(config)#hostname
% Incomplete command.
Router(config)#hostname Buenos_Aires
^
% Invalid input detected at '^' marker.
Router(config)#hostname BuenosAires
^
% Invalid input detected at '^' marker.
Router(config)#hostname BuenosAires
^
% Invalid input detected at '^' marker.
Router(config)#hos
Router(config)#hostname Buenosaires
Buenosaires(config)#crypto key generate rsa
The name for the keys will be: Buenosaires.unad.com
Choose the size of the key modulus in the range of 360 to 2048 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.
How many bits in the modulus [512]: 1024
```

Configuración serial de Buenos Aires a Miami s 0/0/1

```
Buenosaires(config)#interface serial 0/0/1
Buenosaires(config-if)#ip address 172.31.23.2 255.255.255.252
Buenosaires(config-if)#description SERIAL A MIAMI
Buenosaires(config-if)#no shut
```

```
Buenosaires#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Buenosaires(config)#interface serial 0/0/1
Buenosaires(config-if)#ip address 172.31.23.2 255.255.255.252
Buenosaires(config-if)#description SERIAL A MIAMI
Buenosaires(config-if)#no shut
```

Configuración Loopback 4 en Buenos aires

```
Buenosaires(config)#interface loopback 4
Buenosaires(config-if)#ip address 192.168.4.1 255.255.255.0
Buenosaires(config-if)#no shutdown
```

```
Buenosaires(config)#interface loopback 4
Buenosaires(config-if)#
%LINK-5-CHANGED: Interface Loopback4, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed
state to up
Buenosaires(config-if)#ip add
Buenosaires(config-if)#ip address 192.168.4.1 255.255.255.0
Buenosaires(config-if)#no sh
Buenosaires(config-if)#no shutdown
```

Configuración Loopback 5 en Buenos aires

```
Buenosaires(config)#interface loopback 5
Buenosaires(config-if)#ip address 192.168.5.1 255.255.255.0
Buenosaires(config-if)#no shutdown
```

```
Buenosaires(config)#inter
Buenosaires(config)#interface lo
Buenosaires(config)#interface loopback 5
Buenosaires(config-if)#
%LINK-5-CHANGED: Interface Loopback5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback5, changed
state to up
ip add
Buenosaires(config-if)#ip address 192.168.5.1 255.255.255.0
Buenosaires(config-if)#no s
Buenosaires(config-if)#no suh
Buenosaires(config-if)#no sh
Buenosaires(config-if)#no shutdown
Buenosaires(config-if)#
```

Configuración Loopback 6 en Buenos aires

```
Buenosaires(config)#interface loopback 6
Buenosaires(config-if)#ip address 192.168.6.1 255.255.255.0
Buenosaires(config-if)#no shutdown
```

```
Buenosaires(config)#inter
Buenosaires(config)#interface lo
Buenosaires(config)#interface loopback 6

Buenosaires(config-if)#
%LINK-5-CHANGED: Interface Loopback6, changed state to up

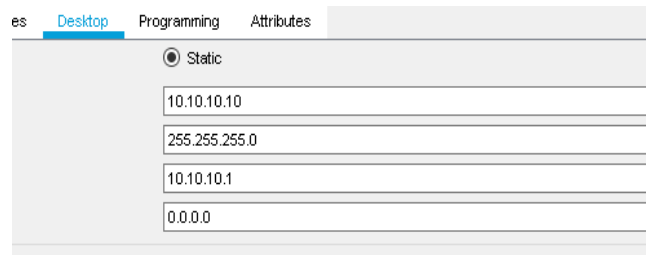
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, changed
state to up
ip add
Buenosaires(config-if)#ip address 192.168.6.1 255.255.255.0
Buenosaires(config-if)#no sh
Buenosaires(config-if)#no shutdown
Buenosaires(config-if)#
```

Creamos una ruta estática

```
Buenosaires(config)#ip route 0.0.0.0 0.0.0.0 seri
Buenosaires(config)#ip route 0.0.0.0 0.0.0.0 serial 0/0/1
```

```
Buenosaires(config-if)#
Buenosaires(config-if)#
Buenosaires(config-if)#
Buenosaires(config-if)#exit
Buenosaires(config)#ip route 0.0.0.0 0.0.0.0 seri
Buenosaires(config)#ip route 0.0.0.0 0.0.0.0 serial 0/0/1
%Default route without gateway, if not a point-to-point interface,
may impact performance
Buenosaires(config)#
```

Configuramos el Web Server



The screenshot shows a configuration window with tabs for 'es', 'Desktop', 'Programming', and 'Attributes'. The 'Static' radio button is selected. Below it are four input fields containing the following values: 10.10.10.10, 255.255.255.0, 10.10.10.1, and 0.0.0.0.

Ahora configuraremos los dos Sw con sus políticas de seguridad

```
Switch(config)#enable secret cisco
Switch(config)#line console 0
Switch(config-line)#password cisco
Switch(config-line)#login
Switch(config-line)#line vty 0 15
Switch(config-line)#password cisco
Switch(config-line)#login
Switch(config-line)#exit
Switch(config)#serv
Switch(config)#service pass
Switch(config)#service password-encryption
Switch(config)#banerr
Switch(config)#ban
Switch(config)#banner mo
Switch(config)#banner motd #Esta ingresando en un dispositivo tipo T1, lo invitamos a
desconectarse inmediatamente ya que puede tener implicaciones penales
```

```
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#enable secret cisco
Switch(config)#line console 0
Switch(config-line)#password cisco
Switch(config-line)#login
Switch(config-line)#line vty 0 15
Switch(config-line)#password cisco
Switch(config-line)#login
Switch(config-line)#exit
Switch(config)#serv
Switch(config)#service pass
Switch(config)#service password-encryption
Switch(config)#banerr
Switch(config)#ban
Switch(config)#banner mo
Switch(config)#banner motd #Esta ingresando en un dispositivo tipo
T1, lo invitamos a desconectarse inmediatamente ya que puede tener
implicaciones penales
Enter TEXT message.  End with the character '#'.
```

Ctrl+F6 to exit CLI focus

Copy Paste

```
Switch(config)#hostname S2
S2(config)#enable secret cisco
S2(config)#line console 0
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#line vty 0 15
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#exit
S2(config)#trasn
S2(config)#tra
S2(config)#ser
S2(config)#service pass
S2(config)#service password-encryption
S2(config)#baner
S2(config)#banee
S2(config)#ban
S2(config)#banner mo
S2(config)#banner motd # Esta ingresando en un dispositivo tipo T1, lo invitamos a
desconectarse inmediatamente ya que puede tener implicaciones penales
```

```

Switch(config)#hos
Switch(config)#hostname S2
S2(config)#enable secret cisco
S2(config)#line console 0
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#line vty 0 15
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#exit
S2(config)#trasm
S2(config)#tra
S2(config)#ser
S2(config)#service pass
S2(config)#service password-encryption
S2(config)#baner
S2(config)#banee
S2(config)#ban
S2(config)#banner mo
S2(config)#banner motd # Esta ingresando en un dispositivo tipo Tl,
lo invitamos a desconectarse inmediatamente ya que puede tener
implicaciones penales

```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

1. Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

OSPFv2 area 0

Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	5.5.5.5
Router ID R3	8.8.8.8
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	256 Kb/s
Ajustar el costo en la métrica de S0/0 a	9500

Configuramos OSPF en el router de Bogotá

```
Bogota(config)#router ospf 1
Bogota(config-router)#rou
Bogota(config-router)#router-id 1.1.1.1
Bogota(config-router)#net
Bogota(config-router)#network 172.31.21.0 0.0.0.3 area 0
Bogota(config-router)#network 192.168.30.0 0.0.0.255 area 0
Bogota(config-router)#network 192.168.40.0 0.0.0.255 area 0
Bogota(config-router)#network 192.168.200.0 0.0.0.255 area 0
Bogota(config-router)#network 192.168.99.0 0.0.0.255 area 0
Bogota(config-router)#pass
Bogota(config-router)#passive-interface de
Bogota(config-router)#passive-interface default
Bogota(config-router)#no passive-interface serial 0/0/0
```

```
Bogota(config-router)#rou
Bogota(config-router)#router-id 1.1.1.1
Bogota(config-router)#net
Bogota(config-router)#network 172.31.21.0 0.0.0.3 area 0
Bogota(config-router)#network 192.168.30.0 0.0.0.255 area 0
Bogota(config-router)#network 192.168.40.0 0.0.0.255 area 0
Bogota(config-router)#network 192.168.200.0 0.0.0.255 area 0
Bogota(config-router)#network 192.168.99.0 0.0.0.255 area 0
Bogota(config-router)#pass
Bogota(config-router)#passive-interface de
Bogota(config-router)#passive-interface default
Bogota(config-router)#no pass|
Bogota(config-router)#no passive-interface 0/0/0
                                     ^
% Invalid input detected at '^' marker.
```

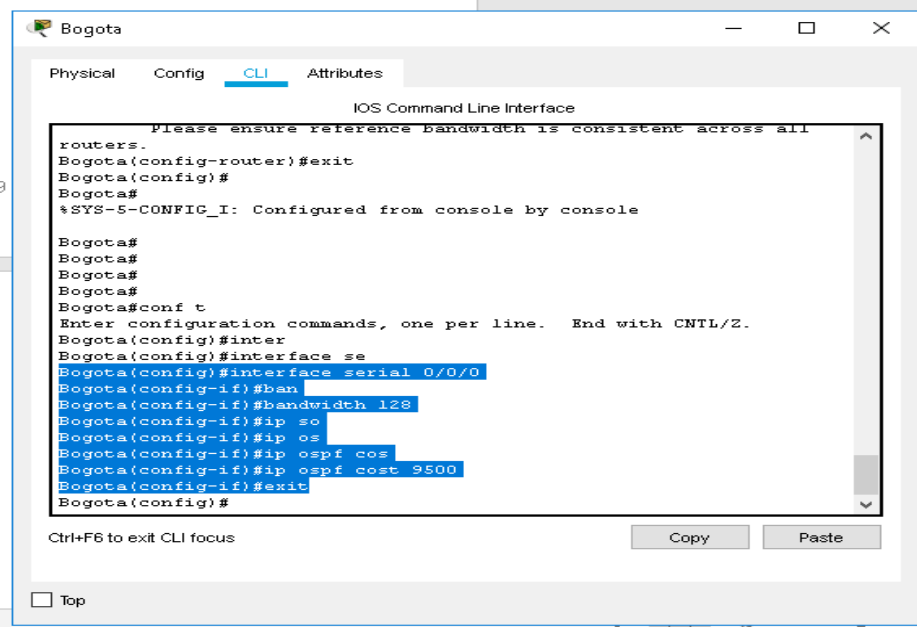
SE calcula dinámicamente el costo

Bogota(config-router)#auto-cost reference-bandwidth 1000

```
C | Bogota(config-router)#no passive-interface serial 0/0/0
  | Bogota(config-router)#au
  | Bogota(config-router)#auto-cost re
  | Bogota(config-router)#auto-cost reference-bandwidth 1000
  | ‡ OSPF: Reference bandwidth is changed.
  |   Please ensure reference bandwidth is consistent across all
  | routers.
  | Bogota(config-router)#exit
  | Bogota(config)#
```

Ajustamos la interfaz s0/0/0

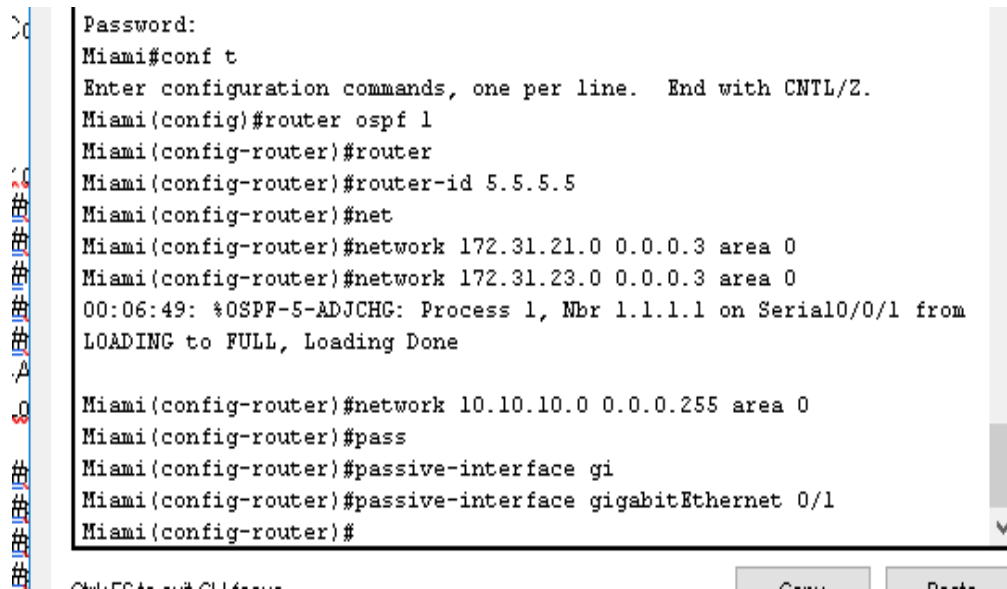
```
Bogota(config)#interface serial 0/0/0
Bogota(config-if)#bandwidth 128
Bogota(config-if)#ip so
Bogota(config-if)#ip os
Bogota(config-if)#ip ospf cost 9500
Bogota(config-if)#exit
```

Configuramos OSPF en el router de Miami

```
Miami(config)#router ospf 1
Miami(config-router)#router
Miami(config-router)#router-id 5.5.5.5
Miami(config-router)#net
Miami(config-router)#network 172.31.21.0 0.0.0.3 area 0
Miami(config-router)#network 172.31.23.0 0.0.0.3 area 0
00:06:49: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/1 from
LOADING to FULL, Loading Done
```

```
Miami(config-router)#network 10.10.10.0 0.0.0.255 area 0
Miami(config-router)#pass
Miami(config-router)#passive-interface gi
Miami(config-router)#passive-interface gigabitEthernet 0/1
```



```
> Password:
Miami#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Miami(config)#router ospf 1
Miami(config-router)#router
Miami(config-router)#router-id 5.5.5.5
Miami(config-router)#net
Miami(config-router)#network 172.31.21.0 0.0.0.3 area 0
Miami(config-router)#network 172.31.23.0 0.0.0.3 area 0
00:06:49: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/1 from
LOADING to FULL, Loading Done

Miami(config-router)#network 10.10.10.0 0.0.0.255 area 0
Miami(config-router)#pass
Miami(config-router)#passive-interface gi
Miami(config-router)#passive-interface gigabitEthernet 0/1
Miami(config-router)#
```

SE calcula dinámicamente el costo

Miami(config-router)#auto-cost reference-bandwidth 1000

```
Miami(config-router)#  
Miami(config-router)#auto-cost re  
Miami(config-router)#auto-cost reference-bandwidth 1000  
% OSPF: Reference bandwidth is changed.  
Please ensure reference bandwidth is consistent across all  
routers.  
Miami(config-router)#
```

Ajustamos la interfaz s0/0/0 s0/0/1

```
Miami(config)#interface serial 0/0/1  
Miami(config-if)#bandwidth 128  
Miami(config-if)#  
Miami(config-if)#inter  
Miami(config-if)#exit  
Miami(config)#inter  
Miami(config)#interface serial  
Miami(config)#interface serial 0/0/0  
Miami(config-if)#bandwidth 128  
Miami(config-if)#ip ospf cost 9500  
Miami(config-if)#exit
```

```

Miami(config)#in
Miami(config)#interface serial 0/0/1
Miami(config-if)#ban
Miami(config-if)#bandwidth 128
Miami(config-if)#
Miami(config-if)#inter
Miami(config-if)#exit
Miami(config)#inter
Miami(config)#interface serial
Miami(config)#interface serial 0/0/0
Miami(config-if)#ban
Miami(config-if)#bandwidth 128
Miami(config-if)#ip os
Miami(config-if)#ip ospf cos
Miami(config-if)#ip ospf cost 9500
Miami(config-if)#exit
Miami(config)#

```

Configuramos OSPF en el router de Buenos aires

```

Buenosaires(config)#router ospf 1
Buenosaires(config-router)#router
Buenosaires(config-router)#router-id 8.8.8.8
Buenosaires(config-router)#net
Buenosaires(config-router)#network 172.31.23.0 0.0.0.3 area 0
Buenosaires(config-router)#net
Buenosaires(config-router)#network
00:22:36: %OSPF-5-ADJCHG: Process 1, Nbr 5.5.5.5 on Serial0/0/1 from
LOADING to FULL, Loading Done
192.168.4.0 0.0.3.255 area 0
Buenosaires(config-router)#pas
Buenosaires(config-router)#passive-interface lo
Buenosaires(config-router)#passive-interface loopback 4
Buenosaires(config-router)#passive-interface loopback 5
Buenosaires(config-router)#passive-interface loopback 6

```

The screenshot shows a web-based CLI interface for a device named 'Buenos Aires'. The 'CLI' tab is active. The terminal output shows the following sequence of commands and responses:

```
User Access Verification
Password:
Buenosaires>enable
Password:
Buenosaires#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Buenosaires(config)#router ospf 1
Buenosaires(config-router)#router
Buenosaires(config-router)#router-id 8.8.8.8
Buenosaires(config-router)#net
Buenosaires(config-router)#network 172.31.23.0 0.0.0.3 area 0
Buenosaires(config-router)#net
Buenosaires(config-router)#network
00:22:36: %OSPF-5-ADJCHG: Process 1, Nbr 5.5.5.5 on Serial0/0/1 from
LOADING to FULL, Loading Done
192.168.4.0 0.0.3.255 area 0
Buenosaires(config-router)#pas
Buenosaires(config-router)#passive-interface lo
Buenosaires(config-router)#passive-interface loopback 4
Buenosaires(config-router)#passive-interface loopback 5
Buenosaires(config-router)#passive-interface loopback 6
Buenosaires(config-router)#
```

Below the terminal window, there are buttons for 'Copy' and 'Paste', and a 'Top' link.

Calculo el costo

Buenosaires(config-router)#auto-cost reference-bandwidth 1000

```
Buenosaires(config-router)#auto-cost cos
Buenosaires(config-router)#auto-cost re
Buenosaires(config-router)#auto-cost reference-bandwidth 1000
% OSPF: Reference bandwidth is changed.
Please ensure reference bandwidth is consistent across all
```

Ajustamos la interfaz s0/0/1

```
Buenosaires(config)#interface serial 0/0/1
Buenosaires(config-if)#ban
Buenosaires(config-if)#bandwidth 128
Buenosaires(config-if)#exit
```

```
Enter configuration commands, one per line. End with CNTL/Z.
Buenosaires(config)#inter
Buenosaires(config)#interface se
Buenosaires(config)#interface serial 0/0/1
Buenosaires(config-if)#ban
Buenosaires(config-if)#bandwidth 128
Buenosaires(config-if)#exit
Buenosaires(config)#
```

Visualizamos los vecinos

```
Buenosaires#  
Buenosaires#show ip ne  
Buenosaires#show ip ospf ne  
Buenosaires#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address
Interface				
5.5.5.5	0	FULL/ -	00:00:34	172.31.23.1

Buenosaires#

Ctrl+F6 to exit CLI focus

Copy Paste

```
Neighbor ID      Pri  State           Dead Time   Address  
Interface  
8.8.8.8          0    FULL/ -         00:00:39   172.31.23.2  
Serial0/0/0  
1.1.1.1          0    FULL/ -         00:00:37   172.31.21.1  
Serial0/0/1  
Miami#
```

Ctrl+F6 to exit CLI focus

Copy Paste

```
Neighbor ID      Pri  State           Dead Time   Address  
Interface  
5.5.5.5          0    FULL/ -         00:00:36   172.31.21.2  
Serial0/0/0  
Bogota#
```

Visualizamos las interfaces de cada router

```
Bogota#show ip ospf interface
Bogota#show ip ospf interface

Serial0/0/0 is up, line protocol is up
  Internet address is 172.31.21.1/30, Area 0
  Process ID 1, Router ID 1.1.1.1, Network Type POINT-TO-POINT, Cost:
9500
  Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit
  5
    Hello due in 00:00:02
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1 , Adjacent neighbor count is 1
    Adjacent with neighbor 5.5.5.5
  Suppress hello for 0 neighbor(s)
Bogota#
```

24/5/2014 14:14:44

Config

Router

```
Serial0/0/1 is up, line protocol is up
  Internet address is 172.31.21.2/30, Area 0
  Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT, Cost:
647
  Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit
  5
    Hello due in 00:00:03
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1 , Adjacent neighbor count is 1
    Adjacent with neighbor 1.1.1.1
  Suppress hello for 0 neighbor(s)
Serial0/0/0 is up, line protocol is up
  Internet address is 172.31.23.1/30, Area 0
  Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT, Cost:
9500
  Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
  No designated router on this network
  No backup designated router on this network
```

24/5/2014 14:14:44

Config

Router


```
Serial0/0/1 is up, line protocol is up
Internet address is 172.31.23.2/30, Area 0
Process ID 1, Router ID 8.8.8.8, Network Type POINT-TO-POINT, Cost:
647
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit
5
Hello due in 00:00:08
Index 1/1, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 5.5.5.5
Suppress hello for 0 neighbor(s)
Loopback4 is up, line protocol is up
Internet address is 192.168.4.1/24, Area 0
Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 0
Loopback interface is treated as a stub Host
```

Ctrl+F6 to exit CLI focus

Copy Paste

Visualizaremos el proceso ospf

```
Buenosaires#
Buenosaires#show ip pro
Buenosaires#show ip protocols

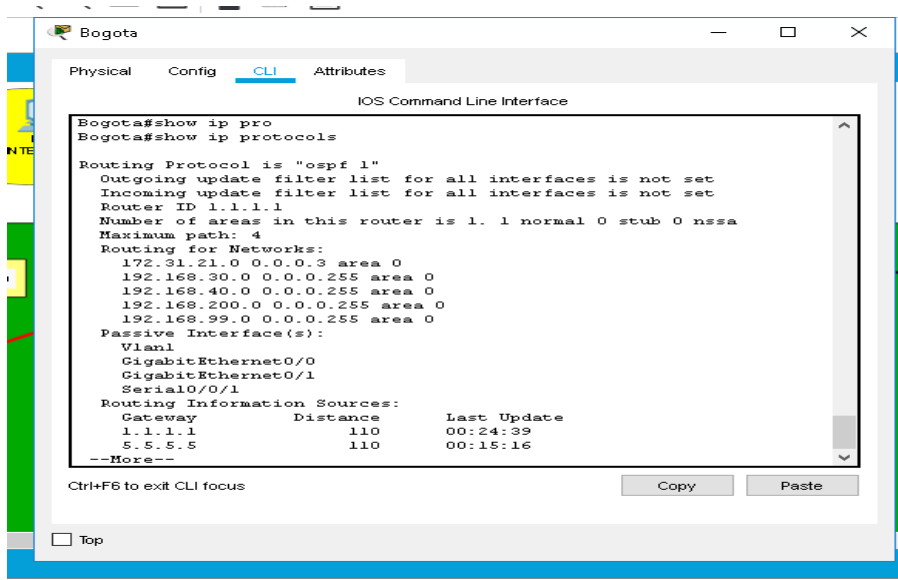
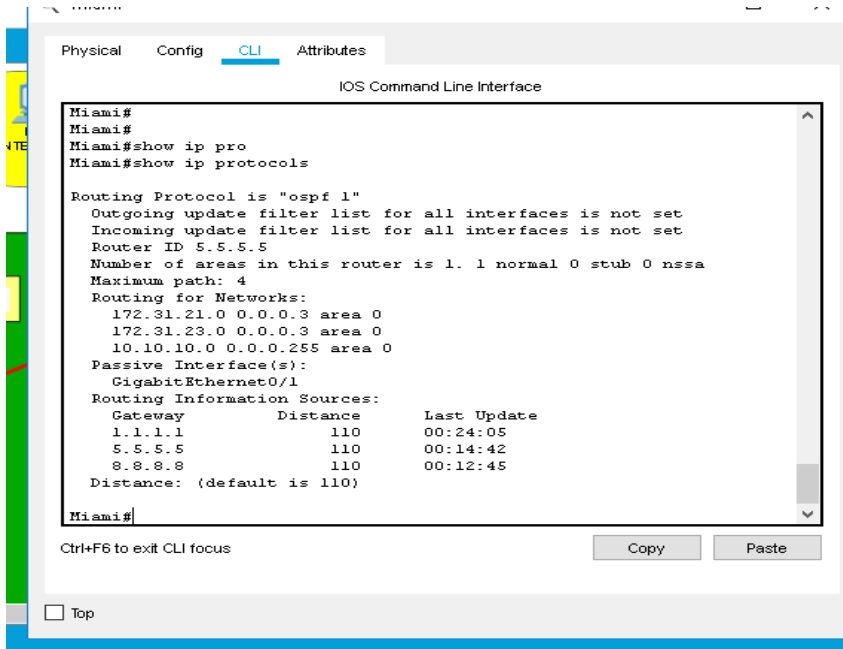
Routing Protocol is "ospf 1"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 8.8.8.8
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
172.31.23.0 0.0.0.3 area 0
192.168.4.0 0.0.3.255 area 0
Passive Interface(s):
Loopback4
Loopback5
Loopback6
Routing Information Sources:
Gateway Distance Last Update
1.1.1.1 110 00:23:19
5.5.5.5 110 00:13:56
8.8.8.8 110 00:11:59
Distance: (default is 110)

Buenosaires#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top



Configuraremos ahora las VLAN y demás características como puertos troncales acceso y seguridad

Configuración S1

```
S1(config-vlan)#nam
S1(config-vlan)#name Administracion
S1(config-vlan)#vlan 40
S1(config-vlan)#name Mercadeo
S1(config-vlan)#vlan 200
S1(config-vlan)#name Mantenimiento
S1(config-vlan)#vlan 99
S1(config-vlan)#name troncal
S1(config-vlan)#exit
S1(config)#interface vlan 99
S1(config-if)#ip add
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shutdown
S1(config-if)#exit
S1(config)#ip de
S1(config)#ip default-gateway 192.168.30.1
```

```
addr
shut
it
3
efault
S1(config)#vlan 30
S1(config-vlan)#nam
S1(config-vlan)#name Administracion
S1(config-vlan)#vlan 40
S1(config-vlan)#name Mercadeo
S1(config-vlan)#vlan 200
S1(config-vlan)#name Mantenimiento
S1(config-vlan)#vlan 99
S1(config-vlan)#name troncal
S1(config-vlan)#exit
S1(config)#vlan 99
S1(config-vlan)#ip add
S1(config-vlan)#ip a
S1(config-vlan)#ip addre
S1(config-vlan)#inter
S1(config-vlan)#exit
S1(config)#inter
S1(config)#interface vlan 99
S1(config-if)#
*LINK-5-CHANGED: Interface Vlan99, changed state to up
```

Configuramos los puertos trunk

```
S1(config)#interface fastEthernet 0/3
S1(config-if)#sw
S1(config-if)#switchport mo
S1(config-if)#switchport mode acc
S1(config-if)#switchport mode tr
S1(config-if)#switchport mode trunk
```

```
S1(config-if)#swi
S1(config-if)#switchport tr
S1(config-if)#switchport trunk na
S1(config-if)#switchport trunk native vl
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
S1(config)#inter
S1(config)#interface fas
S1(config)#interface fastEthernet 0/24
S1(config-if)#swi
S1(config-if)#switchport mo
S1(config-if)#switchport mode tr
S1(config-if)#switchport mode trunk
```

```
S1(config-if)#swi
S1(config-if)#switchport tr
S1(config-if)#switchport trunk na
S1(config-if)#switchport trunk native vl
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
```

```

S1(config)#inter
S1(config)#interface fas
S1(config)#interface fastEthernet 0/3
S1(config-if)#sw
S1(config-if)#switchport mo
S1(config-if)#switchport mode acc
S1(config-if)#switchport mode tr
S1(config-if)#switchport mode trunk

S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed state to up

S1(config-if)#swi
S1(config-if)#switchport tr
S1(config-if)#switchport trunk na
S1(config-if)#switchport trunk native vl
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
S1(config)#inter
S1(config)#interface fas
S1(config)#interface fastEthernet 0/24
S1(config-if)#swi
S1(config-if)#switchport mo
S1(config-if)#switchport mode tr
S1(config-if)#switchport mode trunk

S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed state to up

S1(config-if)#swi
S1(config-if)#switchport tr
S1(config-if)#switchport trunk na

```

Configuramos puertos de acceso y seguridad

```

S1(config)#interface range f0/2,f0/4-23, g0/1-2
S1(config-if-range)#swi
S1(config-if-range)#switchport mo
S1(config-if-range)#switchport mode acc
S1(config-if-range)#switchport mode access
S1(config-if-range)#ine
S1(config-if-range)#in
S1(config-if-range)#exit
S1(config)#inter
S1(config)#interface f0/1
S1(config-if)#switchport access vlan 30
S1(config-if)#exit
S1(config)#interface range f0/2,f0/4-23,g0/1-2
S1(config-if-range)#shutdown

```

```

S1(config)#inter
S1(config)#interface ra
S1(config)#interface range f0/2,f0/4-23, g0/1-2
S1(config-if-range)#swi
S1(config-if-range)#switchport mo
S1(config-if-range)#switchport mode acc
S1(config-if-range)#switchport mode access
S1(config-if-range)#ine
S1(config-if-range)#in
S1(config-if-range)#exit
S1(config)#inter
S1(config)#interface f0/1
S1(config-if)#si
S1(config-if)#simo
S1(config-if)#swi|
S1(config-if)#switchport mo
S1(config-if)#switchport mode ac
S1(config-if)#switchport mode access v
S1(config-if)#switchport mode access vl
S1(config-if)#switchport ac
S1(config-if)#switchport access vl
S1(config-if)#switchport access vlan 30
S1(config-if)#exit
S1(config)#inter
S1(config)#interface ra
S1(config)#interface range f0/2,f0/4-23,g0/1-2
S1(config-if-range)#shu
S1(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down

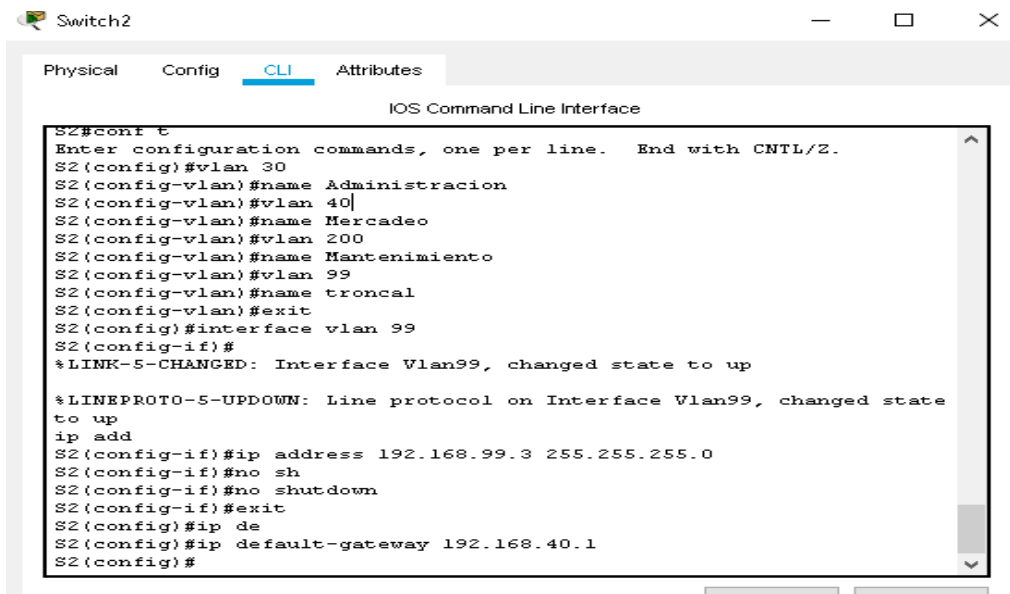
```

Configuración S2

```

S2(config)#vlan 30
S2(config-vlan)#name Administracion
S2(config-vlan)#vlan 40
S2(config-vlan)#name Mercadeo
S2(config-vlan)#vlan 200
S2(config-vlan)#name Mantenimiento
S2(config-vlan)#vlan 99
S2(config-vlan)#name troncal
S2(config-vlan)#exit
S2(config)#interface vlan 99
S2(config-if)#
S2(config-if)#ip address 192.168.99.3 255.255.255.0
S2(config-if)#no sh
S2(config-if)#no shutdown
S2(config-if)#exit
S2(config)#ip de
S2(config)#ip default-gateway 192.168.40.1

```

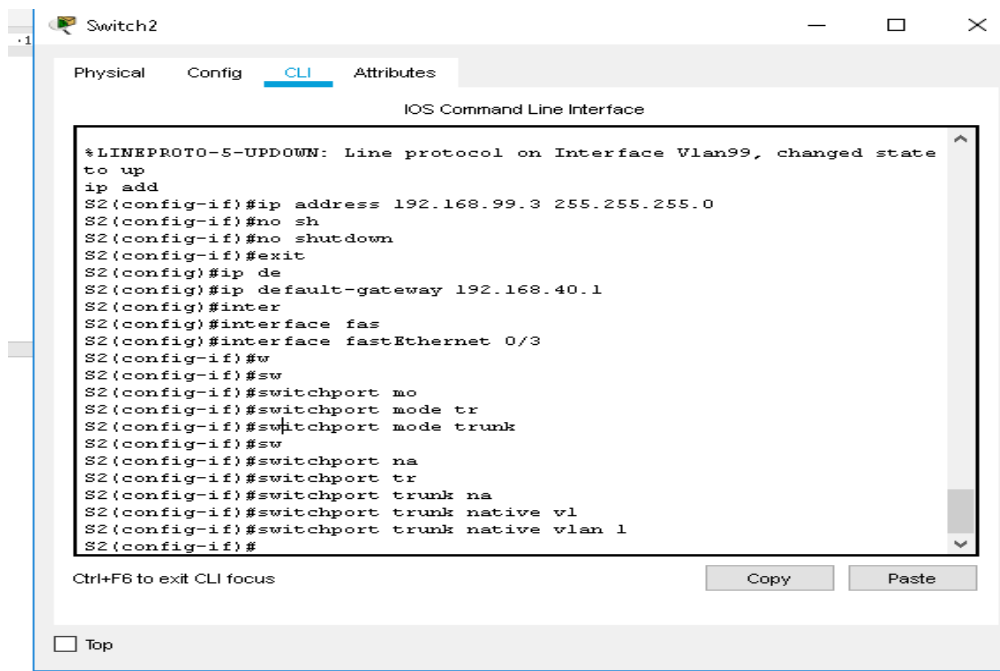


Configuro puertos trunk

```

S2(config)#interface fastEthernet 0/3
S2(config-if)#w
S2(config-if)#sw
S2(config-if)#switchport mo
S2(config-if)#switchport mode tr
S2(config-if)#switchport mode trunk
S2(config-if)#sw
S2(config-if)#switchport na
S2(config-if)#switchport tr
S2(config-if)#switchport trunk na
S2(config-if)#switchport trunk native vl
S2(config-if)#switchport trunk native vlan 1

```



Configuramos puertos de acceso y seguridad

```

S2(config)#interface ra
S2(config)#interface range f0/1-2,f0/4-24,g0/1-2
S2(config-if-range)#swi
S2(config-if-range)#switchport mo
S2(config-if-range)#switchport mode ac
S2(config-if-range)#switchport mode access
S2(config-if-range)#sh
S2(config-if-range)#shutdown
2(config)#inter
S2(config)#interface fa
S2(config)#interface fastEthernet 0/1
S2(config-if)#no sh
S2(config-if)#no shutdown
S2(config-if)#swi
S2(config-if)#switchport mo
S2(config-if)#switchport mode access
S2(config-if)#switchport access vlan 40
S2(config-if)#exit

```



```

S2(config-if)#sw
S2(config-if)#sw
S2(config-if)#switchport mo
S2(config-if)#switchport mode tr
S2(config-if)#switchport mode trunk
S2(config-if)#sw
S2(config-if)#switchport na
S2(config-if)#switchport tr
S2(config-if)#switchport trunk na
S2(config-if)#switchport trunk native vl
S2(config-if)#switchport trunk native vlan 1
S2(config-if)#exit
S2(config)#
S2(config)#inter
S2(config)#interface ra
S2(config)#interface range f0/1-2,f0/4-24,g0/1-2
S2(config-if-range)#swi
S2(config-if-range)#switchport mo
S2(config-if-range)#switchport mode ac
S2(config-if-range)#switchport mode access
S2(config-if-range)#sh
S2(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down

```

Ctrl+F6 to exit CLI focus

Configuramos vlan inter-routing

Configuramos en el router de Bogotá en la interfaz g0/0

```

Bogota(config)#interface gigabitEthernet 0/0.30
Bogota(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.30,
changed state to up

```

```

Bogota(config-subif)#des
Bogota(config-subif)#description ADMINISTRACION-LAN
Bogota(config-subif)#en
Bogota(config-subif)#encapsulation do
Bogota(config-subif)#encapsulation dot1Q 30
Bogota(config-subif)#ip add
Bogota(config-subif)#ip address 192.168.30.1 255.255.255.0
Bogota(config-subif)#exit
Bogota(config)#interface gigabitEthernet 0/0.40
Bogota(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.40, changed state to up

```

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.40, changed state to up

```
Bogota(config-subif)#des
Bogota(config-subif)#description MERCADEO-LAN
Bogota(config-subif)#en
Bogota(config-subif)#encapsulation do
Bogota(config-subif)#encapsulation dot1Q 40
Bogota(config-subif)#ip add
Bogota(config-subif)#ip address 192.168.40.1 255.255.255.0
Bogota(config-subif)#exit
Bogota(config)#in
```

```
Bogota(config)#interface gigabitEthernet 0/0.200
```

```
Bogota(config-subif)#
```

%LINK-5-CHANGED: Interface GigabitEthernet0/0.200, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.200, changed state to up

```
de
```

```
Bogota(config-subif)#de
Bogota(config-subif)#des
Bogota(config-subif)#description MANTENIMIENTO-NETWORK
Bogota(config-subif)#en
Bogota(config-subif)#encapsulation do
Bogota(config-subif)#encapsulation dot1Q 200
Bogota(config-subif)#ip add
Bogota(config-subif)#ip address 192.168.200.1 255.255.255.0
Bogota(config-subif)#exit
```

```
Bogota(config)#interface gigabitEthernet 0/0.99
```

```
Bogota(config-subif)#
```

%LINK-5-CHANGED: Interface GigabitEthernet0/0.99, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.99, changed state to up

```
des
```

```
Bogota(config-subif)#description TRONCAL-SI-S2
Bogota(config-subif)#en
Bogota(config-subif)#encapsulation do
Bogota(config-subif)#encapsulation dot1Q 99
Bogota(config-subif)#ip add
Bogota(config-subif)#ip address 192.168.99.1 255.255.255.0
Bogota(config-subif)#exit
```

```
Bogota(config)#inter
```

```
Bogota(config)#interface goi
```

```
Bogota(config)#interface gi
```

```

Bogota(config)#interface gigabitEthernet 0/0
Bogota(config-if)#no sh
Bogota(config-if)#no shutdown
Bogota(config-if)#exit
Bogota(config)#

```

```

Bogota(config)#interface gi
Bogota(config)#interface gi
Bogota(config)#interface gigabitEthernet 0/0.30
Bogota(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.30, changed state to up

Bogota(config-subif)#des
Bogota(config-subif)#description ADMINISTRACION-LAN
Bogota(config-subif)#en
Bogota(config-subif)#encapsulation do
Bogota(config-subif)#encapsulation dot1Q 30
Bogota(config-subif)#ip add
Bogota(config-subif)#ip address 192.168.30.1 255.255.255.0
Bogota(config-subif)#exit
Bogota(config)#interface gigabitEthernet 0/0.40
Bogota(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.40, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.40, changed state to up

Bogota(config-subif)#des
Bogota(config-subif)#description MERCADEO-LAN
Bogota(config-subif)#en
Bogota(config-subif)#encapsulation do
Bogota(config-subif)#encapsulation dot1Q 40
Bogota(config-subif)#ip add
Bogota(config-subif)#ip address 192.168.40.1 255.255.255.0
Bogota(config-subif)#exit
Bogota(config)#in
Bogota(config)#interface gigabitEthernet 0/0.200
Bogota(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.200, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.200, changed state to up
de
Bogota(config-subif)#de

```

Ctrl+FS to exit CLI focus

```

Bogota(config-subif)#ip address 192.168.40.1 255.255.255.0
Bogota(config-subif)#exit
Bogota(config)#in
Bogota(config)#interface gigabitEthernet 0/0.200
Bogota(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.200, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.200, changed state to up
de
Bogota(config-subif)#de
Bogota(config-subif)#des
Bogota(config-subif)#description MANTENIMIENTO-NETWORK
Bogota(config-subif)#en
Bogota(config-subif)#encapsulation do
Bogota(config-subif)#encapsulation dot1Q 200
Bogota(config-subif)#ip add
Bogota(config-subif)#ip address 192.168.200.1 255.255.255.0
Bogota(config-subif)#exit
Bogota(config)#interface gigabitEthernet 0/0.99
Bogota(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.99, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.99, changed state to up
des
Bogota(config-subif)#description TRONCAL-SI-S2
Bogota(config-subif)#en
Bogota(config-subif)#encapsulation do
Bogota(config-subif)#encapsulation dot1Q 99
Bogota(config-subif)#ip add
Bogota(config-subif)#ip address 192.168.99.1 255.255.255.0
Bogota(config-subif)#exit
Bogota(config)#inter
Bogota(config)#interface goi
Bogota(config)#interface gi
Bogota(config)#interface gigabitEthernet 0/0
Bogota(config-if)#no sh
Bogota(config-if)#no shutdown
Bogota(config-if)#exit
Bogota(config)#

```

Implementaremos ahora NAT, DHCP y sus respectivas configuraciones

Configurare DHCP en R Bogotá haciendo hincapié en la exclusión de address ip

```
Bogota(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
Bogota(config)#ip dhcp ex
Bogota(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
Bogota(config)#ip dh
Bogota(config)#ip dhcp poo
Bogota(config)#ip dhcp pool ADMINISTRACION
Bogota(dhcp-config)#
Bogota(dhcp-config)#dns
Bogota(dhcp-config)#dns-server 10.10.10.11
Bogota(dhcp-config)#dhc
Bogota(dhcp-config)#dhcp
Bogota(dhcp-config)#exit
Bogota(config)#ip dhcp pool ADMINISTRACION
Bogota(dhcp-config)#de
Bogota(dhcp-config)#default-router 192.168.30.1
Bogota(dhcp-config)#net
Bogota(dhcp-config)#network 192.168.30.0 255.255.255.0
Bogota(dhcp-config)#exit
Bogota(config)#ip dh
Bogota(config)#ip dhcp po
Bogota(config)#ip dhcp pool MERCADEO
Bogota(dhcp-config)#
Bogota(dhcp-config)#dns
Bogota(dhcp-config)#dns-server 10.10.10.11
Bogota(dhcp-config)#ip do
Bogota(dhcp-config)#default-router 192.168.40.1
Bogota(dhcp-config)#net
Bogota(dhcp-config)#network 192.168.40.0 255.255.255.0
Bogota(dhcp-config)#exit
Bogota(config)#ip doma
Bogota(config)#ip domain-name unad.com
Bogota(config)#exit
Bogota#
```

```

Bogota(config)#
Bogota(config)#
Bogota(config)#ip dh
Bogota(config)#ip dhcp ex
Bogota(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
Bogota(config)#ip dhcp ex
Bogota(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
Bogota(config)#ip dh
Bogota(config)#ip dhcp poo
Bogota(config)#ip dhcp pool ADMINISTRACION
Bogota(dhcp-config)#
Bogota(dhcp-config)#dns
Bogota(dhcp-config)#dns-server 10.10.10.11
Bogota(dhcp-config)#dhc
Bogota(dhcp-config)#dhcp
Bogota(dhcp-config)#exit
Bogota(config)#dh[
Bogota(config)#dhch
Bogota(config)#d
Bogota(config)#dhcp
Bogota(config)#dhcp po
Bogota(config)#ip dh
Bogota(config)#ip dhcp po
Bogota(config)#ip dhcp pool ADMINISTRACION
Bogota(dhcp-config)#default-router 192.168.30.1
Bogota(dhcp-config)#net
Bogota(dhcp-config)#network 192.168.30.0 255.255.255.0
Bogota(dhcp-config)#exit
Bogota(config)#ip dh
Bogota(config)#ip dhcp po
Bogota(config)#ip dhcp pool MERCADERO
Bogota(dhcp-config)#
Bogota(dhcp-config)#dns
Bogota(dhcp-config)#dns-server 10.10.10.11
Bogota(dhcp-config)#ip do
Bogota(dhcp-config)#ip domain-na
Bogota(dhcp-config)#ip domain-name

```

Realizamos la configuración de NAT

```

Miami(config)#username usuarioweb pri
Miami(config)#username usuarioweb privilege 15 se
Miami(config)#username usuarioweb privilege 15 secret cisco

```

```

Miami(config)#access-list 1 pe
Miami(config)#access-list 1 permit 192.168.30.0 0.0.0.255
Miami(config)#access-list 1 permit 192.168.40.0 0.0.0.255
Miami(config)#access-list 1 permit 192.168.4.0 0.0.3.255
Miami(config)#ip na
Miami(config)#ip nat poo
Miami(config)#ip nat pool internet 209.165.200.225 209.165.200.228 netmask
255.255.255.248
Miami(config)#ip nat inse
Miami(config)#ip nat in
Miami(config)#ip nat inside sou
Miami(config)#ip nat inside source lis
Miami(config)#ip nat inside source list 1 pool internet
Miami(config)#p nat inside source static 10.10.10.10 209.165.200.229
% Ambiguous command: "p nat inside source static 10.10.10.10 209.165.200.229 "
Miami(config)#ip nat inside source static 10.10.10.10 209.165.200.229
Miami(config)#inter

```

```

Miami(config)#interface gi
Miami(config)#interface gigabitEthernet 0/1
Miami(config-if)#ip na
Miami(config-if)#ip nat ou
Miami(config-if)#ip nat outside
Miami(config-if)#inter
Miami(config-if)#exit
Miami(config)#inter
Miami(config)#interface gi
Miami(config)#interface gigabitEthernet 0/0
Miami(config-if)#ip na
Miami(config-if)#ip nat ins
Miami(config-if)#ip nat inside
Miami(config-if)#exit

```

The screenshot shows a terminal window titled "Miami" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following commands and their results:

```

Miami (config) #acc
Miami (config) #access-list 1 per
Miami (config) #access-list 1 permit 192.168.30.0 0.0.0.255
Miami (config) #access-list 1 pe
Miami (config) #access-list 1 permit 192.168.30.0 0.0.0.255
Miami (config) #access-list 1 permit 192.168.40.0 0.0.0.255
Miami (config) #access-list 1 permit 192.168.4.0 0.0.3.255
Miami (config) #ip na
Miami (config) #ip nat poo
Miami (config) #ip nat pool internet 209.165.200.225 209.165.200.228 netmask 255.255.255.248
Miami (config) #ip nat inse
Miami (config) #ip nat in
Miami (config) #ip nat inside sou
Miami (config) #ip nat inside source lis
Miami (config) #ip nat inside source list 1 pool internet
Miami (config) #ip nat inside source static 10.10.10.10 209.165.200.229
Miami (config) #ip nat inside source static 10.10.10.10 209.165.200.229
Miami (config) #inter
Miami (config) #interface gi
Miami (config) #interface gigabitEthernet 0/1
Miami (config-if) #ip na
Miami (config-if) #ip nat ou
Miami (config-if) #ip nat outside
Miami (config-if) #inter
Miami (config-if) #exit
Miami (config) #inter
Miami (config) #interface gi
Miami (config) #interface gigabitEthernet 0/0
Miami (config-if) #ip na
Miami (config-if) #ip nat ins
Miami (config-if) #ip nat inside
Miami (config-if) #exit
Miami (config) #

```

At the bottom of the terminal window, there is a prompt: "Ctrl+F6 to exit CLI focus".

Se muestra los hosts de cada vlan el cual ya tienen su direccionamiento por dhcp

PC0

Physical Config **Desktop** Programming Attributes

DHCP Static

IP Address 192.168.30.31

Subnet Mask 255.255.255.0

Default Gateway 192.168.30.1

DNS Server 10.10.10.11

IPv6 Configuration

PC1

Physical Config **Desktop** Programming Attributes

DHCP Static

IP Address 192.168.40.31

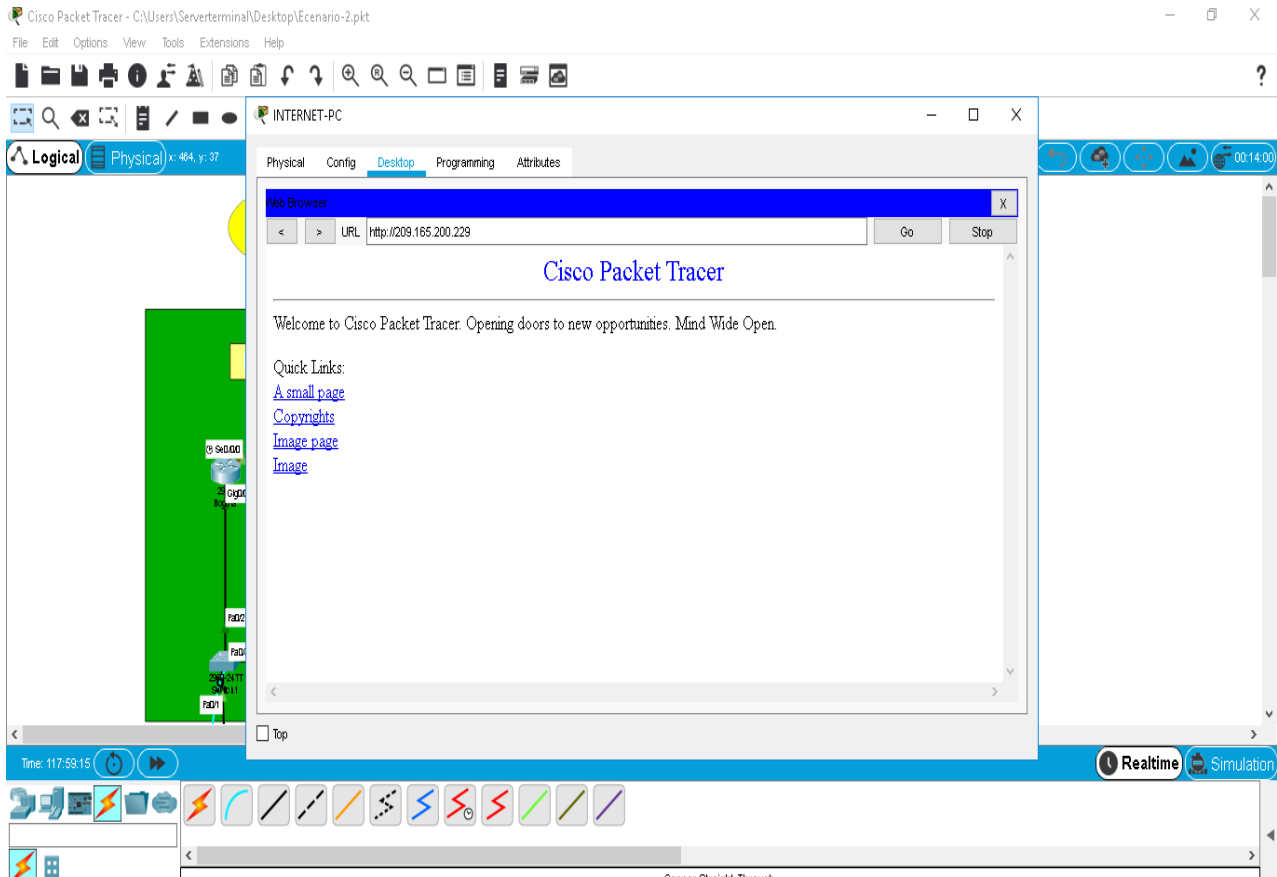
Subnet Mask 255.255.255.0

Default Gateway 192.168.40.1

DNS Server 10.10.10.11

IPv6 Configuration

Realizamos I la comprobación de salida en la PC-INTERNET



Configurar al menos dos listas de acceso de tipo estándar a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2

Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2

Router Miami

```
Miami(config)#ip access-list standard INFRAESTRUCTURA
Miami(config-std-nacl)#per
Miami(config-std-nacl)#permit hos
Miami(config-std-nacl)#permit host 172.31.21.1
Miami(config-std-nacl)#exit
Miami(config)#line vty 0 4
Miami(config-line)#ac
Miami(config-line)#acc
Miami(config-line)#acces
Miami(config-line)#access-class INFRAESTRUCTURA in
Miami(config-line)#exit
```

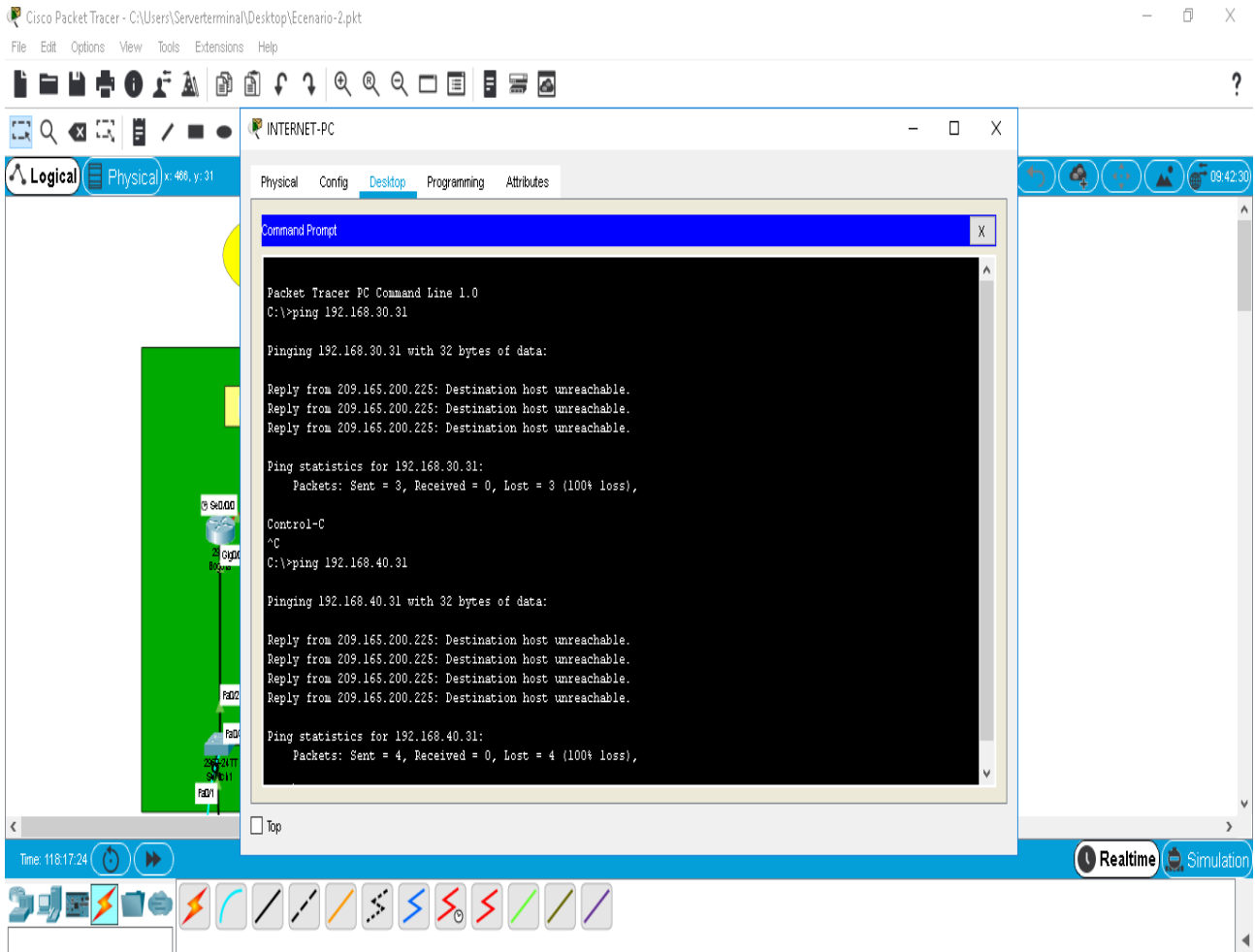
```
Miami>enable
Password:
Miami#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Miami(config)#ip cc
Miami(config)#ip
Miami(config)#ip a
Miami(config)#ip access-list st
Miami(config)#ip access-list standard INFRAESTRUCTURA
Miami(config-std-nacl)#per
Miami(config-std-nacl)#permit hos
Miami(config-std-nacl)#permit host 172.31.21.1
Miami(config-std-nacl)#exit|
Miami(config)#line vty 0 4
Miami(config-line)#ac
Miami(config-line)#acc
Miami(config-line)#acces
Miami(config-line)#access-class INFRAESTRUCTURA in
Miami(config-line)#exit
Miami(config)#
```

Crearemos otra Política en Miami

```
Miami(config)#access-list 101 permit tcp any host 209.165.200.229 eq www
Miami(config)#acc
Miami(config)#access-list 101 per
Miami(config)#access-list 101 permit icmp an
Miami(config)#access-list 101 permit icmp any an
Miami(config)#access-list 101 permit icmp any any ec
Miami(config)#access-list 101 permit icmp any any echo
Miami(config)#access-list 101 permit icmp any any echo-reply
Miami(config)#inter
Miami(config)#interface gi
Miami(config)#interface gigabitEthernet 0/1
Miami(config-if)#ip ac
Miami(config-if)#ip access-group 101 in
Miami(config-if)#exit
```

```
Miami(config)#access-list 101 permit tcp any host 209.165.200.229 eq
www
Miami(config)#acc
Miami(config)#access-list 101 per
Miami(config)#access-list 101 permit icmp an
Miami(config)#access-list 101 permit icmp any an
Miami(config)#access-list 101 permit icmp any any ec
Miami(config)#access-list 101 permit icmp any any echo
Miami(config)#access-list 101 permit icmp any any echo-reply
Miami(config)#inter
Miami(config)#interface gi
Miami(config)#interface gigabitEthernet 0/1
Miami(config-if)#ip ac
Miami(config-if)#ip access-group 101 in
Miami(config-if)#exit
Miami(config)#
```

Verificamos que la política funcione



CONCLUSIONES

En el presente trabajo del diplomado de profundización de cisco se adquirió habilidades básicas en el desarrollo de configuración y resolución de problemas CISCO, esto a su vez fomenta mi aprendizaje al camino de la certificación CCNA R&S que tiene como finalidad formarme como especialista en esta marca.

BIBLIOGRAFÍA

CISCO. (2014). Enrutamiento Dinámico. Principios de Enrutamiento y Conmutación. Recuperado de <https://static-course-assets.s3.amazonaws.com/RSE50ES/module7/index.html#7.0.1.1>

CISCO. (2014). Traducción de direcciones IP para IPv4. Principios de Enrutamiento y Conmutación. Recuperado de <https://static-course-assets.s3.amazonaws.com/RSE50ES/module11/index.html#11.0.1.1>

CISCO. (2014). DHCP. Principios de Enrutamiento y Conmutación. Recuperado de <https://static-course-assets.s3.amazonaws.com/RSE50ES/module10/index.html#10.0.1.1>